D AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

INDO-PACIFIC FISHERIES COUNCIL

PROCEEDINGS

6TH SESSION

TOKYO

JAPAN

30th September—14th October, 1955

SECTION I

IPFC Secretariat, FAO Regional Office
for Asia and the Far East
Bangkok

1957

OFFICE-BEARERS OF THE INDO-PACIFIC FISHERIES COUNCIL, 1955-57

Chairman	Dr. N. K. Panikkar (India)
Vice-Chairman	Mr. D. J. Rochford (Australia)
Retiring Chairman	Nai Boon Indrambarya (Tha
*Secretary**	Dr. Cecil Miles

*The FAO Regional Fisheries Officer for Asia and the Far East and *ex-officio* Executive Secretary Council.

MEMBERS OF TECHNICAL COMMITTEES

	Committee I (Biology and Hydrology)	Committee II (Technology)
Australia	Dr. M. Blackburn	Mr. F. F. Anderson
Burma	U Ba Kyaw	U Ba Kyaw
Cambodia	Mons. Dom-Saveun	Mons. R. Lafont
Ceylon	Mr. E. R. A. de Zylva	Mr. L. F. Tissevera
France	Mons. J. Lemasson	Mons. R. Serene
India	Dr. B. S. Bhimachar	Dr. D. Bhatia
Indonesia	Mr. H. Saanin	Mr. G. M. C. Kasum
Japan	*Dr. K. Kuronuma	Mr. N. Oka
Korea	Mr. Chee Choul Keun	Mr. Nam Sang Kyu
Netherlands	No nomination	No nomination
Pakistan	Dr. Nazir Ahmad	*Dr. M. R. Qureshi
Philippines	Mr. H. R. Montalban	Mr. C. Martin
Thailand	Nai Prida Karnasut	Nai T. Bumradarinpa
United Kingdom	Dr. F. D. Ommanney	Dr. Tham Ah Kow
U.S.A.	Dr. L. A. Walford	Mr. G. M. Taggart
Viet Nam	Mons. Cao Thien Buu	Dr. Ngo Ba Thanh

* Chairman

INDO-PACIFIC FISHERIES COUNCIL

PROCEEDINGS

6TH SESSION

TOKYO

JAPAN

30th September—14th October, 1955

SECTION I

IPFC Secretariat, FAO Regional Office
for Asia and the Far East
Bangkok

1957

PRINTED AT THE
DIOCESAN PRESS, MADRAS—1957. C5469

CONTENTS

		Page
	ADDRESS BY MINISTER OF AGRICULTURE & FORESTRY	1
	ADDRESS BY MINISTER OF FOREIGN AFFAIRS	2
	AGENDA FOR 6TH COUNCIL SESSION	3
	SUMMARY REPORT OF 6TH SESSION	5
*1.	Inauguration	5
11.	Statements by Delegates & Observers	5
71.	Steering Committee	10
72.	Membership, Credentials	11
74.	Council's Report to FAO	11
76.	Amendments to Agreement & Rules	11
79.	Parliamentary Procedure	12
80.	Nomination of Technical Committees and Correspondents	12
82.	Time & Place of 7th Session	12
84.	Staff	12
87.	Budget	13
90.	Implementation of 5th Session Directives	13
92.	External Relations	13
93.	Technical Assistance & Technical Instruction	13
113.	FAO Survey of Living Aquatic Resources	15
118.	Evaluation of the Council's Work	16
126.	Publications & Bibliography	18
	TECHNICAL COMMITTEE II	
138.	Craft and Gear	19
156.	Food Technology	21
160.	Socio-economics and Statistics	22
	TECHNICAL COMMITTEE I	
179.	Indo-Pacific Fisheries Year	24
199.	Sea Fisheries	26
209.	Miscellaneous Fisheries	27
227.	Closing Session	29
	INTERNATIONAL TECHNICAL CONFERENCE ON THE CONSERVATION OF THE LIVING RESOURCES OF THE SEA	31
	RECOMMENDATIONS RELATIVE TO DATA FOR COLLECTION DURING THE INDO-PACIFIC FISHERIES YEAR	34
	REPORT OF THE EXECUTIVE COMMITTEE TO THE 6TH SESSION	35
1.	Membership	35
2.	Meetings	35
3.	Travel	35
5.	Membership of Executive Committee	35
6.	Staff	35
7.	Budget and Accounts	35
	Executive Committee Travel	36
	Printing	36
	Meeting	36
	Miscellaneous	36
11.	Implementation of 5th Session Directives	37
	Inland Fisheries	38

* Paragraph number in the text.

CONTENTS

		Page
	Sea Fisheries	38
	Miscellaneous Fisheries	38
	Craft and Gear	38
	Food Technology	38
	Socio-economics and statistics	38
27.	Technical Committees	38
28.	Council Correspondents	39
33.	External Relations	39
	UNESCO	39
	United Nations	40
	F.A.O.	40
	Other Organizations	40
56.	Publications	41
60.	Bibliographies	41
73.	Technical Assistance	41
79.	Technical Instruction	42
85.	Council's Agreement and Rules	42
88.	Parliamentary Procedure	42
89.	Documents issued	42
REVIEW OF THE COUNCIL'S WORK		43
PART I—INTRODUCTION		43
PART II—WORK OF THE COUNCIL'S COMMITTEES		44
1.	Technical Committee I (Hydrology & Biology)	44
1.1	Sea Fisheries Panel	44
1.11	Oceanic Fisheries (Tuna)	44
1.12	Inshore Fisheries	45
1.13	Sea Fisheries (General)	46
1.2	Inland Fisheries Panel	46
1.3	Miscellaneous Fisheries Panel	48
1.31	Oceanography and Limnology	48
1.32	Plankton	49
1.33	Crustacea	50
1.34	Seaweeds	50
1.35	Taxonomy	51
2.	Technical Committee II (Technology)	51
2.1	Craft and Gear Panel	51
2.11	Catalogue of Local Fishing Methods	51
2.12	Non-indigenous Gear	52
2.13	Harbour Facilities	52
2.14	Gear Preservation	52
2.2	Food Technology Panel	53
2.3	Socio-economics and Statistics Panel	54
2.31	Statistics	54
2.32	Socio-economics	55
2.33	Marketing and Distribution	55
3.	Fisheries Development Working Group	56
4.	General Business	56
4.1	Survey of Institutions	56
4.2	Register of Projects	56
4.3	Bibliographies	56
4.31	Sector Bibliographies	56
4.32	Current Bibliographies	57
4.33	Subject Bibliographies	57

CONTENTS

	Page
4.4 Handbooks	57
4.5 Technical Assistance and Technical Instruction	58
4.51 Technical Assistance	58
4.52 Technical Instruction	58
4.6 Co-operation	58
4.7 Films	58
4.8 Miscellaneous Recommendations to Member Governments	58
PART III—Statements of Member Governments	59
PART IV—Organization of Council Work	60
The Council's Objectives	60
The Council's Agencies	60
Committee Work	60
The Council's Worksheet	61
Committee Reports	61
Technical Papers	62
Recommendations	63
Appendix I—Summary of Resolutions	65
Appendix II—Statements by Member Governments	70

APPENDIX II

STATEMENTS BY MEMBER GOVERNMENTS

Australia	70
Cambodia	71
Ceylon	71
France	72
India	72
Indonesia	73
Japan	74
Korea	74
Netherlands (for New Guinea)	75
Pakistan	76
Philippines	79
Thailand	80
United Kingdom (for Malaya, Singapore and Hong Kong)	80
United States of America	82
Viet Nam	83
Report of Technical Committee I to the 6th Session	84
0. Introduction	84
1. Council Resolutions	84
1.1 World Faunal Changes	84
1.2 Water Pollution	85
1.3 River Basin Development	85
1.4 Rastrelliger	85
1.5 Age determination in Tropical Fishes	85
2. Inland Fisheries	86
2.1 River Basin Development	86
2.2 Water Pollution	89
2.3 Stocking & Compatability	90
2.4 International Fry Exchange	96
2.5 Paddy field culture of Fish	97

CONTENTS

PAGE

3. HILSA INVESTIGATIONS 98
4. CHANOS INVESTIGATIONS 99
5. FOOD & FEEDING OF FISHES 100
6. SEA FISHERIES 102
   6.1 Neritic-Pelagic Fisheries 102
   6.2 Sub-Committee on Rastrelliger 102
   6.3 Rastrelliger Fisheries 102
   6.4 Other Pelagic Fisheries 104
   6.5 Oceanic Fisheries 105
7. MISCELLANEOUS FISHERIES & GENERAL BIOLOGY 106
   7.1 Oceanography 106
   7.2 Plankton 108
   7.3 Miscellaneous Fisheries 109
8. CONSERVATION OF LIVING RESOURCES OF THE SEA 110

REPORT OF TECHNICAL COMMITTEE II TO THE 6th SESSION 112

O. INTRODUCTION 112

I. CRAFT AND GEAR 112
   Appraisal of Mechanization of Fishing from Small, Indigenous Craft .. 112
   Relative Merits of Inboard and Outboard Engines 115
   Evaluation of the Introduction of Non-Indigenous Fishing Methods .. 116
   Design of Recommended Craft for Small Boat Fisheries of the Region 119
   Appraisal Under Fishing Conditions of Net and Rope Preservatives .. 119
   Practical Investigations on the Use and Effect of Fishing with Lights .. 120
   Indigenous versus Imported Materials for Construction of Nets and other Gear 120
   Exploration for new Shrimp Resources 121

II. FOOD TECHNOLOGY 121
   A Study of Improved Methods for the Production and Storage of Dried Fish, with Particular Reference to Methods Suitable for Wet, Humid Seasons of the Year 122
   General Comments on the Problems of Processing and Storage .. 129
   Programme of Investigations 130
   Participation in Research Programme 131
   Other Research Work in Progress on Fish and Marine Products Processing and Preservation 131

III. SOCIO-ECONOMICS AND STATISTICS 132
   Advances in the Collection of Adequate Fisheries Statistics, Including Sampling Survey Methods in the Production Phase 133
   Socio-economic Problems Affecting the Production and Distribution of Fisheries Products 136
   Advances in the Development of Fish Marketing and Distribution; Development of Consumption of Fisheries Products to Improve Nutrition; the Effect of Consumer Tastes for Non-customary Products and Means of Influencing Them 140
   Development of Fisheries Extension Services 142
   The Significance of Fish Culture as an Integral Part of Rural Economy 144

LIST OF DELEGATES AND OBSERVERS 158

COUNCIL CORRESPONDENTS FOR 1955-57 163

LIST OF DOCUMENTS 168

ING ADDRESS OF HIS EXCELLENCY, MR. ICHIRO KONO, MINISTER AGRICULTURE AND FORESTRY, AT THE SIXTH SESSION OF THE INDO-PACIFIC FISHERIES COUNCIL

Tokyo, Japan, 30 September 1955

Chairman, Distinguished Delegates, Ladies ntlemen :

a great honour for me to have an opportu- extend my sincere greetings and welcome to the opening of the Sixth Session of the cific Fisheries Council.

you know, Japan highly appreciates the ments of the Indo-Pacific Fisheries Council, been cooperating enthusiastically since she a member of this Council in 1952. Both vernment and people of Japan, therefore, happy to have invited that this meeting at Tokyo.

world food production has remarkably in- in recent years, thanks to the untiring efforts ountries concerned as well as the Food and ture Organization of the United Nations. be admitted, however, however, that the present food n in the Indo-Pacific region is still far from tory. Much greater increases in food pro- are required, especially in the field of products as a source of protein supply. indeed a valuable resource and an indispen- tem of nutrition for the people of this

rvey of the situation of marine products in o-Pacific region shows that the greater part marine resources in this vast area remains oped. One of the important questions for gion in the future, therefore, is to discover exploit, utilize and conserve these unde- resources.

uld like especially to point out that my is obliged by force of circumstances to heavily upon aquatic resources in order to its teeming population with adequate food. r this reason that, compared with other Japan has an overwhelmingly greater of people who are engaged in the fishing es. The Japanese Government is making fforts to develop these industries as one of asures to help reconstruct her national economy as well as to solve her acute food problem. We are, therefore, looking forward with keen interest to the outcome of this Session in Tokyo.

I therefore believe it to be of great significance that we are gathered here to sit in conference for about two weeks, to discuss various technical problems related to the fisheries which are common to the countries of this region.

As the host Government we have done our best in making the preparations for this conference. I realise, however, that there is still much to be desired and I hope that you will be so kind as to give us your generous indulgence and cooperation so that this conference may be crowned with success.

In this connection I should like to call your attention to the post-conference field trip we have planned for the delegations. I sincerely hope that this trip will afford an opportunity to observe this country as she actually is as well as her fishing industry, and thereby take away with you a fair understanding of Japan and her fisheries.

During your stay in my country, you will find the manners, customs and climate of Japan quite different from what you are used to ; nevertheless, I hope you will have a most pleasant sojourn while you are here.

In conclusion, may I ask you, Mr. Chairman, to convey to Dr. Cardon, the Director-General of FAO, my personal greetings and my Government's satisfaction that the Sixth Session of the Indo-Pacific Fisheries Council is being held in Japan, and also to express my thanks to Dr. Finn, Director of the Fisheries Division of FAO represented at this Session by Mr. Fiedler ; to Dr. Miles, Executive Secretary of the Indo-Pacific Fisheries Council and Regional Fisheries Officer of FAO, and to all the FAO personnel who have given us guidance and assistance in the preparations for this conference.

I now have great pleasure in declaring open the Sixth Session of the Indo-Pacific Fisheries Council.

MESSAGE FROM HIS EXCELLENCY, MR. NAMORU SHIGEMITS FOREIGN MINISTER, TO THE SIXTH SESSION OF THE INDO PACIFIC FISHERIES COUNCIL

Tokyo, Japan, 30 September 1955

Mr. Chairman, Honourable Delegates, Ladies and Gentlemen:

On behalf of the Government and people of Japan, I wish to extend to you my hearty greetings on the occasion of the opening of the Sixth Session of the Indo-Pacific Fisheries Council.

It was only last spring that FAO held its 3rd Session of the Asia-Pacific Forestry Commission in Tokyo and it was last year that the 4th Session of the International Rice Commission was held in our country. Japan, as the host country, feels it an honour and a pleasure that Tokyo has for the third time been selected by FAO as the site for the present Session of the Indo-Pacific Fisheries Council. We are very happy to see that such a large number of fisheries authorities and experts of international fame have come to participate in this meeting from various countries.

Fishing is one of the most important industries of Japan. Being surrounded by sea, Japan owes very much to the aquatic products, the main source of animal protein supply to feed her people. Therefore, naturally enough, we have a very keen interest in how to properly conserve these invaluable marine resources as well as how to exploit and utilize them to the fullest extent. I understand that the present gathering will be devoted for study of such problems solely from the scientific and technical point of view, and I am sure that various discussions in this Session will doubtlessly be of great value to all the nations concerned for the development of their respective fishing industries, which, I believe, will result in raising the nutritional standard of the people in this region.

Fishing is also one of the most popu bies of the Japanese people, which at t time serves to add some nutrition to th per. I dare say that almost all of the people have at least some experience of some on the high seas, some on a river a at a small pond in the countryside. I ma bold to conclude that this, along with vari of fish in the sea around Japan, is one reasons for the fact that a great variety o methods are used in my country—from primitive way of using just a single rod an a small wooden boat to large-scale fishi mother-vessels of more than several thous together with catcherboats. If any of the are interested in some of the fishing techn have and wish to utilize them, both the ment and people in the fishing industry are ready to be at your service and als operate with any member nations, requested. It is my sincere hope that du stay in Japan, short as it may be, you wi to make first hand observation on th industry of Japan, and also that this ses become an opportunity of promoting c operation among the member countries.

In concluding, I would like to express that your sojourn in Japan will prove to able as well as profitable, and I wish sent session of the Council be crowned w success.

Thank you.

AGENDA FOR 6TH COUNCIL SESSION

Tokyo, Japan, 30 September–14 October 1955

ocedural Items

Adoption of the Agenda (IPFC/C55/1).

Report on Credentials.

Statements of Delegations.

Report of the Executive Committee (IPFC/).

4·1 Membership.

4·2 External relations.

4·21 With United Nations Organization.

4·22 With FAO.

4·22*a* FAO World Survey of Fishery Resources.

4·23 With UNESCO.

4·24 Other.

4·3 Council's Report to FAO (IPFC/ C55/12).

4·4 Publications and Editorial Policy.

4·41 Proceedings Sections I and II and 5th Meeting Symposium.

4·42 Special Publications and Handbooks.

4·43 Register of Institutions.

4·44 Bibliographic work.

4·45 Other.

4·5 Financial and Budget Report.

4·6 Special Evaluation Report on the Council's work (IPFC/C55/2-A).

Proposal by the Government of Thailand mendments to the Council's Agreement /C55/3) :—

THAT, in the Council's Agreement, the word 'meeting' be deleted wherever it occurs and substituted by the word 'session'.

THAT the second and third sentences of paragraph 2 of Article II of the Council's Agreement be deleted, commencing with the word 'Decisions' and ending with the word 'quorum'.

THAT the following be added to paragraph 3 of Article II of the Council's Agreement after the full stop following the word 'Committee':

'In the unavoidable absence of one or two members of the Executive Committee from a Committee session, the Chairman shall have the power to co-opt the chairman of Technical Committee I or of Technical Committee II, or both, at his discretion, to substitute the absent Committee member or members for that Committee session only, provided that one permanent member of the Executive Committee shall always be present and that the number of voting members attending the Committee session shall in no case exceed three.'

6. Proposal for Amendments to the Rules of Procedure.

6·1 Proposal by the Executive Committee for certain Amendments to the Council's Rules of Procedure, specified in IPFC/C55/4.

6·2 'Notes on Parliamentary Procedure' (IPFC/C55/5).

7. Nomination of Technical Committees.

8. Nomination of Council Correspondents.

9. Proposal by Technical Committee I for an 'Indo-Pacific Fisheries Year' (IPFC/C55/6).

10. Time and Place of 7th Session.

B. Technical Items

11. Reports of Technical Committees for period 1954/55.

12. Technical Assistance.

13. Technical Instruction.

14. Matters for Technical Committee I.

14·1 Inland Fisheries and Fish Culture.

14·10 Soil Composition in relation to Aquatic Productivity (Item proposed by Government of India).

14·11 Fish Culture in Rice Fields (Item proposed by F.A.O. for joint action with International Rice Commission) [IPFC/ 55/7].

14·12 Pollution of Waters (Resolution 55/3).

14·12*a* Control of Vegetation including floating grasses (Item proposed by Governments of India and Thailand, IPFC/C55/8).

14·13 Densities and Combinations of Species.

14·14 Food and Feeding of Fishes.

14·15 Fisheries in River Development Schemes (Resolution 55/4).
14·16 Exchange of Cultivable Species.
14·16*a* Introduction of Exotic Species, e.g., Black Bass (Item proposed by Government of Ceylon, IPFC/C55/10).
14·17 Work of Chanos Sub-Committee.
14·18 Work of Hilsa Sub-Committee.
14·19 Outline of Programme for ensuing Period.

14·2 Sea Fisheries.
14·21 Age Determination of Tropical Fishes.
14·22 Fishing with Lights.
14·23 Tuna—Evaluation of Work to date.
14·24 Other groups, e.g., Clupeoids, Engraulids, Scombroids, Carangids.
14·25 Work of Rastrelliger Sub-Committee.
14·26 Outline of Programmes for Ensuing period.

14·3 Miscellaneous Fisheries.
14·31 Advances in Collection and Recording of Oceanographic Data with Application to Fisheries.
14·32 UNESCO Activities in Oceanography (see 4·23).
14·33 Implementation of Recommendations on Plankton (Proc., I, 1954, p. 85-86).
14·34 'Possible Changes in Aquatic Faunal Distribution due to gross Modification of World Climate' (Resolution 55/2).
14·35 Outcome of Shrimp Symposium—Biology and Ecology.
14·36 Outline of Programmes for ensuing period (Notes: The terms of reference of this Panel cover Oceanology, Limnology, Plankton, Crustacea, Mollusc, Seaweeds, Taxonomy, Minor Fisheries).

14·4 Evaluation of Committee Work during Period and Means for Improvement.

15. Matters for Technical Committee II

15·1 Craft and Gear.
15·11 Outboard versus Inbo gines.
15·12 Appraisal of Mechaniz Fishing from Sma genous Craft.
15·13 Evaluation of introdu Non-indigenous F Methods.
15·14 Indigenous versus I Materials for constru Nets and other Gear.
15·15 Outcome of Shrimp Sy —Fishing Methods.
15·16 Outline of Program ensuing period.

15·2 Food Technology.
15·21 Production and Storage Fish with special ref humid, rainy weather
15·22 Outcome of Shrimp posium—Processing, and Transportation.
15·23 Outline of Program ensuing period.

15·3 Statistics, Socio-economics a keting.
15·31 Advances in the Colle Adequate Fisheries S including sampling methods, in the pr phase.
15·32 Outline of Program ensuing period.

15·4 Evaluation of Committee Wor recent period and mea improvement.

16. Inter-Committee Working Group o ries Development.

17. Subject for Symposium at 7th Sessi

C. Election of Chairman and Vice-Ch for ensuing period

D. Any other business

SUMMARY REPORT OF THE SIXTH SESSION OF THE INDO-PACIFIC FISHERIES COUNCIL

The 6th Session of the Indo-Pacific Fisheries il was opened by the Honourable Minister griculture and Forestry in Sankei Kaikan, , Japan, on Friday, 30 September 1955.

The Chairman, Mr. Boon Indrambarya, in the Honourable Minister to declare the 6th n officially open, thanked the Government of on behalf of the Council for the gracious in- n to hold this Session in Tokyo, and also on of the delegates for the arrangements made eir reception and for the excellent meeting es. He believed that it was especially appro- that this Session of the Council, which led with the 10th anniversary of the Food griculture Organization, should be held in a y in which fish formed such an important f the diet and which has, therefore, develop- fishing industry. He praised the spirit of tion of the Japanese fishermen and fishery ists, which he believed were responsible for naintenance of reasonable standards of on for a growing population living on a ely small arable land area.

The Chairman added that most of the ies represented are faced with the same m of balancing food and population. Their nments are becoming more and more con- of the urgency to turn to the water for fish ource of additional food and it was hoped lelegates might take back with them the tion that some of their own problems are by ans insuperable. It was stressed that many nments are taking advantage of the skills of ese operatives and technicians, or were form- int fishing companies with Japanese under- , or were applying the results recorded in the ese fishery literature.

The Chairman hoped that the presence of so prominent fishery administrators and experts Session might result, not only in cementing nds of friendship which have received ex- on in the past Sessions of the Council, but is spirit of good-will might extend to other nships between nations.

The Honourable Minister of Agriculture and try, after delivering the address, recorded as roduction to this report, graciously declared h Session of the Indo-Pacific Fisheries Coun- be open.

6. The Chairman then introduced the representative of the Honourable Minister of Foreign Affairs of the Japanese Government who, on behalf of the Honourable Minister, conveyed a message to the Council which is also recorded at the opening of this report.

7. The Chairman then requested Mr. R. H. Fiedler to convey a message from Dr. P. V. Cardon, Director-General of the Food and Agriculture Organization. Mr. Fiedler stated that the Director-General had requested him to convey to the Council his sincere wishes for a fruitful and successful session and to express his deep regret that the pressure of his other duties made it impossible for him to be present.

8. The Director-General recalled with great pleasure his visit to Japan a little under a year ago. The warm greeting he received at that time, and the sympathetic understanding which he encountered of the problems FAO is facing had remained an inspiration to him. The leading part which Japan is taking in the work of FAO is evidenced by the fact that the last sessions of the International Rice Commission and of the Asia-Pacific Forestry Commission were held in Tokyo and now this Session of the Indo-Pacific Fisheries Council. Next year, it is understood, Japan would again be host to a FAO-sponsored meeting—this time on nutrition.

9. Finally, the Director-General desired to convey to the Government of Japan his sincere thanks for the time and energy which had gone into making possible this Session of the Council and he expressed the hope that these will be amply justified by the results achieved.

10. The provisional agenda, having been unanimously approved by the Council, the Chairman passed to Item 3 of the Agenda and statements were made by the delegates and observers, as follows :

Statement of Delegations

11. The delegate from *Australia* expressed his pleasure to be attending the sixth session of the Council and once more assured the delegates of the continued support and cooperation of the Australian Government in the Council's work. The Japanese Government had made every effort to facilitate the

successful functioning of the Session. He expressed thanks on behalf of the Australian Government, for the acceptance of this tremendous international responsibility with characteristic energy and determination and wished the present Session of the Council every success. On his own behalf, he also wished to assure the assembled delegates of his own personal cooperation in these activities.

12. The delegate for *Burma* also expressed thanks to the Government of Japan and stated that, since the independence of his country, the Government had realized its responsibility to foster the expansion and improvement of the fishery industry and the newly established Division of Fisheries is engaged in the active re-orientation of fishery policy, although the staff available is still inadequate. This was the main reason why Burma is not yet able to contribute substantially in the work of the Council.

13. Training and recruitment of staff has, however, been initiated and ways and means are being devised to make Fisheries appointments more attractive.

14. The inland fisheries are fairly well exploited and further improvement of this seems to depend largely on the capacity to undertake stocking operations, there being as yet no fish fry industry in Burma and proper technique in handling, transporting and nursing are still lacking. Two officers had, at the invitation of the Government of India, toured West Bengal and Orissa, and an active programme to develop the fish fry industry is being undertaken. The Government of India may be approached with a request for a pond culturist.

15. The Government had requested the Government of Canada through the Colombo Plan for a fisheries specialist to organize a programme for mechanized fishing in in-shore waters, and arrangements to implement a project for training in off-shore fishing methods are under way.

16. The delegate for the Royal Government of *Cambodia* requested the Chairman to convey to His Excellency, the Chief of the Japanese Government, his country's thanks for the invitation to participate in the present Session in Tokyo, and for the reception given to the delegates. He was pleased to be once again present at the 6th Council Session and to participate in the cooperative work of the Council.

17. This was the fourth time that Cambodia had been represented, and it was stated that the country had greatly benefited from the Council's work, the National Fishery Service having functioned according to the technical recommendations of the Council. Several officers had been able to increase their knowledge of fish culture and statistics, thanks to training courses given on the Council's recommendation. He re that Cambodia was not yet in a position t greater contributions to the Council's work, of lack of personnel and funds. However, w a purely practical nature was proceeding Government was seeking means to prot fishery resources and to maintain the prod of the inland waters, until such time as q technicians could be found to engage in the sary biological surveys, which, it is hoped, enhanced through the cooperation of the C member countries, and the technical ass which they may graciously provide.

18. The delegate for *Ceylon*, after thank Government of Japan for the opportunity gi fisheries workers of the region to assem Tokyo for the 6th Session of the Council, me the inauguration of a joint Japan-Ceylon venture between the Fisheries Agency Kanagawa Prefecture and a Cooperative Society in Ceylon, with Colombo as its op base, as a tangible indication of Japan's de work with other countries.

19. The Ceylon Government had endea to give support to all programmes of fishing gation and development sponsored by the C so far as available personnel permitted. Ad staff are now being trained to meet the g need for qualified leadership and the Gove has endeavoured to make the fullest use of i tion centres initiated by the Council. The has been instrumental in stimulating consi expansion of Governmental activity in the fishery development in Ceylon, and much p has been achieved during the last few through coordinated FAO and Colombo Technical Assistance programmes, which, it ed, will result in the fuller use of the co fishing resources.

20. The delegate for *France* stated t Government had followed the work of the since its foundation with the greatest interes technical contributions presented by M Governments at the Council's Sessions cons both in quantity and quality, a unique docu tion on the fishery problems of the regio were evidence of the efforts being made Member Governments of the Council t international scientific collaboration.

21. Because of the geographical situa metropolitan France, contributions to this in effort had been rather meagre but the Gove recognizes the benefit received from the C

and will endeavour to participate more effec- in the future.

The work of the Council will be of invalua- sistance in the development of the fisheries territories of the French Union situated out- he Indo-Pacific area. The development of hing industries in New Caledonia was at t engaging the attention of the Government. Oceanographic Laboratory of the Institut is d'Oceanie in New Caledonia had recently ed a research vessel, which would study the esources and would, it was hoped, contribute knowledge of these fishes in the South Ocean.

The French delegation was happy to s its thanks for the welcome extended to the tes, which would result in a better knowledge hnical methods employed by Japanese fisher-

The delegate for *India* believed that no y was better suited for the holding of a il Session than Japan, which is one of the g fishing nations of the world, and the closest ration was anticipated with Japanese fishery s.

In India some progress has been made in y work since the last meeting of the Council, esearch programmes on inland and marine ies having been strengthened both in staff and ment. The question of fisheries research ecently reviewed by an *ad hoc* Committee and second five-year plan, research on Hilsa, Fish re, Sardines, Mackerel and Prawns will be ntially strengthened and mechanized fishing tions will be augmented.

All the States are taking part in an exten- programme of fishery development and ies extension services have been started by the al Government. In addition to the research ns on inland and marine fisheries now in nce, a Fisheries Technological Station is to be ished. Volumes I and II of the Indian al of Fisheries have appeared and it is hoped ng out Vol. III by March 1956. Technical eration programmes with Norway and the d States have also made noteworthy progress. ining centre for mechanized fishing has been d near Bombay to be followed by others in n and Tutucorin; the Inland Fisheries training lcutta continued to attract trainees while a for fisheries administration and research will tablished at Mandapam.

One of the means of developing Council ties is the organization of Co-operative pro- Two such projects—relating to Hilsa and Rastrelliger—are already under active considera- tion by the Council. The Government was happy to note that the Council's Sub-Committee on Hilsa met in Calcutta in June 1955 and had drawn up a programme of research.

28. India has taken a keen interest in the work of the Indo-Pacific Fisheries Council ever since its formation in 1949. Although the achievements of the Council during the six and a half years of its existence are considerable, the time has come for even greater efforts if the Council is to develop into an active organization playing an important part in the development and utilization of the fishery re- sources of the area. The Government is following with interest the possible lines in which Council work could be strengthened and will gladly consider and extend support to any practicable measures calculated to make the work of this organization more effective.

29. The delegate for *Indonesia*, after thanking the Japanese Government, stated that his Govern- ment greatly appreciated the efforts of the Council. Japan is one of the most advanced countries as far as fishing activities are concerned and the holding of the 6th Session in Tokyo will be of particular benefit.

30. Two Japanese training ships had visited Indonesia since the 5th Session, the *Syungkotsu Maru* in 1954, and the *Oshoru Maru* in 1955. The visits of these vessels have been most beneficial to Indonesian workers.

31. The efforts of the Indo-Pacific Fisheries Council and of FAO in Rome in the field of fisher- ies training are greatly appreciated in Indonesia, which has also contributed in the holding of train- ing centres in Inland Fisheries. A third such centre will be held at Bogor in November 1955, with Mr. Hasanuddin Saanin, the Alternate Dele- gate at this Session, as Director.

32. The Indonesian Government had been happy to act as host to the Executive Committee at its 19th Meeting in Indonesia, and would be happy to act as host to the 7th Session of the Council, as a sincere gesture towards the efforts of the Council.

33. The Indonesian delegate believes the formation of a Sub-Committee on Fish Culture in Ricefields, in line with the proposal put forward at the Session of the International Rice Commission in Tokyo in October 1954 to be of the utmost importance.

34. The leader of the *Japanese* delegation, the Director of the Japanese Fisheries Agency, ex- pressed satisfaction that the 6th Council Session was being held in Japan, and it was hoped that the

6th Session would be at least as profitable as the previous ones. This was the first time in the annals of Japanese fisheries that so many distinguished fisheries experts had assembled from so many countries.

35. Japan is situated in the farthest northern part of the Indo-Pacific area, and the aquatic products as well as the fishing vessels, implements and methods are vastly different from those of other member countries. The Japanese depend upon fish for their protein food and consume far larger amounts of fishery products than any other people in the world. Every effort is therefore being made to develop and conserve the aquatic resources, and in this Japan will collaborate closely with other member countries.

36. The delegate for *Korea* wished to congratullate the Chairman and the Secretariat on the excellent arrangements of the Session, and, while reserving detailed technical observations to subsequent sessions, stressed the importance of fishing in the national life and economy of Korea which is surrounded on three sides by water.

37. Commencing with simple indigenous gear, fishing in Korea had gradually developed on modern lines.

38. The United Nations Korean Reconstruction Agency has very actively helped the rehabilitation of the Korean fishing industry which sustained great damage during the turmoil in 1950.

39. Regulation of fishing activities to enable the rational exploitation with proper conservation of the Korean fishing grounds is being earnestly pursued.

40. The Delegate expressed genuine appreciation of the significant service rendered by the Council in effecting valuable exchange of technical information among the member countries and co-ordinating fishery development in the area.

41. The delegate for *Netherlands* expressed thanks for the very good arrangements made by the Government of Japan and the IPFC Secretariat for the 6th Session of the Council. Both Dr. Hardenberg and Mr. Zwollo who, in the past, had represented the Government, actively associating themselves with the Council's work, were unfortunately not able to attend the present Session. The delegate conveyed the best wishes of the Government of Netherlands for a very successful Session of the Council in Tokyo.

42. The delegate for *Pakistan* stated that the work of the Council has been a source of guidance in planning the development of the fisheries of Pakistan.

43. Pursuant to the recommendation Council, work is progressing on the mecha of fishing fleet and the construction o harbour at Karachi. In the field of fish some measures have also been taken. *Til* been introduced in East Pakistan and som exotic fishes are being obtained for pro from Thailand, Malaya, Indonesia and In the help of the International Cooperation A tration of the United States. Under the sa two fisheries experts have been assigned t tan for developing mechanized fishing.

44. The Government of Pakistan w happy to continue her active association operation with the Council and wished to ex best wishes for the success of the Finally, the delegate wished to convey the l greetings of the Government and people of to the Government and people of Japan.

45. The *Philippine* delegate reitera benefits derived from membership of the which has made it possible for Philippine workers to have direct contact with specialists of other member countries es during sessions of the Council, and to see tories, methods and techniques, field practi development programmes being undertaken host country, which are then applied i own country, with a corresponding incr the efforts to increase fisheries pro Seminars and training centres have also ed good results both for the individuals the service, and the fisheries documentati given valuable information to the technical w

46. Tribute was paid to the spirit of c derie at the sessions which has greatly cont to the smooth working of the Council, and has constituted an intangible but nonethele asset. Membership in Council has done towards assisting the Philippines in its to improve fish production and to raise the st of living of people engaged in the fi industries.

47. The delegate for *Thailand* said that fr formation of the Council in 1948, his Gove had evinced a keen interest in the aim activities of the Indo-Pacific Fisheries Coun has been pleased to maintain continued and cooperation with the Council throu Secretariat located in the capital of Thailand country had accepted the recommendations Council in the solution of several fisheri blems and finds in the delegations of M Governments an unfailing source of advi assistance in the vital task of fishery develo

Thai delegation appreciated the Council's
n in bringing up for consideration Thailand's
osal for amendments to the Agreement and
ne study of the floating weed menace.

The delegate for the *United Kingdom* stated
Her Majesty's Government welcomes the
rtunities for the exchange of views on techni-
nd scientific aspects of fisheries which the
ons of this Council afford. Two research
ns have been established on British territory
uth East Asia, the first at Hong Kong and
econd at Singapore.

The most significant feature in the develop-
of the industry in Malaya in recent years
been the steady progress in mechanization.
process is encouraged and fostered by the
rnment through training courses for fisher-
In spite of increased fishing density, the
yearly landings show no increase for the past
years. It is evident that fish must be sought
er afield and that an offshore fleet must be
ed and developed. Preliminary exploratory
with this end in view has already been done
ie headquarters vessel M. F. V. *Dunvegan* and
now be continued and expanded by the
apore Regional Fisheries Research Station.
large entrepot trade which Singapore carried
salt fish has declined rapidly in recent years
g to the restrictive measures of certain import-
ountries. Turning to the fresh water fisheries
improvement in emergency conditions in the
ration of Malaya has led to an increased
est in fish culture, especially in the Chinese
villages.

a. In British North Borneo the culture of
water fish is financed under a Colonial
lopment and Welfare Scheme administered by
Department of Agriculture.

b. In Hong Kong extension work was con-
d by the provision of loans to fishermen for
anization of their vessels; the training of
ers, coxswains and engineers; the intro-
on of non-indigenous fishing methods; and,
echniques of oyster culture based on established
nese methods. The Fish Marketing Organi-
n in the Colony is operating with continuous
ss and in view of increased landings of fish at
arkets various improvements, particularly with
d to landing facilities, are now being actively
dered. The Fisheries Research Unit which
een set up within the Department of Biology
e University possesses its own research vessel,
F.R.V. *Alister Hardy*, and its staff are
ged in research into marine and inland fishe-
oceanography and oyster culture. In addition,
iments with non-indigenous types of fishing gear are being pursued in the fishing grounds within 200 miles of the Colony. The Hong Kong University Fisheries Journal No. 1 was published in December 1954 and it is anticipated that successive volumes recording the scientific work of the Unit will be produced annually.

51. On behalf of the Government of the *Federation of Malaya*, the delegate extended a welcome to the Members of the Rastrelliger Sub-Committee to hold their deliberations in Malaya at any time in 1956 with advance notice.

52. The delegate for the *United States of America* expressed appreciation and thanks for the opportunity for participating in the Session in Japan where interest in the sea and its resources is deep in the hearts of the people and where the Emperor himself is a biologist of great distinction.

53. The formation of many international organizations like the IPFC marks the progress which has been made in interest in fishery research throughout the world during the past decade. The general public which had been hardly aware of the existence of this branch of science has become more conscious of it and has been giving ever-increasing active support to it.

54. Perhaps one of the most important conclusions of past fishery studies has been that to understand the vagaries of abundance and distributions of species, it is necessary to carry on systematic biological and hydrographic studies of the entire ecological systems which they occupy. In many instances, this can be carried on only by international cooperation such as this Council affords.

55. The expansion in research programmes has been accompanied by a scarcity of scientists educated in this field. How can we induce young men to specialize in fishery and oceanographic research? What is the best way to prepare men to direct and conduct the new research programme? How can the talents of those who are experienced in this field be best utilized? These are questions which trouble members of this Council and which perhaps could be discussed during the Session.

56. Finally he conveyed the good wishes of his country for the success of the present Session and for the continued progress of the Council.

57. The delegate for *Viet Nam*, after stating that it was difficult for him to express sufficiently strongly his thanks to the Japanese Government for the manner in which preparations had been made for the holding of the 6th Session because all the adjectives had already been exhausted, stated that Japanese fishing companies had sent

fishing vessels to Viet Nam, which had enabled his country to initiate its own fishermen in the use of non-indigenous gear.

58. Fisheries are of great importance in Viet Nam, which has more than 2,000 kilometers of coastline and an intricate network of inland waterways. Viet Nam has, since the last Session, made great progress in the administration of the fisheries, particularly in the propagation of *Tilapia*, and the area under cultivation has increased tenfold. It is hoped that this tendency will continue, and that the necessary staff and finance will shortly become available so that the production of animal protein food may be intensified.

59. The representative of *Portugal* stated that he was gratified to represent his country as an observer, and added that it gave him great satisfaction to announce that Portugal would very soon become a member of the Council.

60. The observer for *New Zealand* endorsed the general appreciation of the excellent arrangements made by the Government of Japan for the Conference. The Government of New Zealand had been taking the keenest interest in augmenting food production through the Colombo Plan and in other ways.

61. If Japan is in the extreme north of the Area, New Zealand is in the extreme south. Nevertheless there are many problems connected with fisheries in the island territories of New Zealand which extend northward, and the Council's deliberations would be of utmost value in the solution of such problems.

62. The observer for the *International Commission for Scientific Exploration of the Mediterranean* thanked the Council for the invitation to participate in the Session and explained the scope of the work of the Mediterranean Commission in fisheries investigations. The fact that the latter had nominated an observer was a reflection of its great interest in the Council's work.

63. The observer for the *Pacific Science Council* expressed the eagerness of that Council to co-operate in the activities of the Indo-Pacific Fisheries Council, and offered its best wishes for a successful and profitable Conference.

64. The observer for the *South Pacific Commission* conveyed a message from the Secretary-General of the Commission who, on behalf of the Commission, expressed appreciation for the invitation to the Council Session. The Commission welcomed the opportunities which exist for collaborating and co-operating with the Council and the FAO in fields of mutual interest, and looked forward to further developments in this direc the near future. He wished the Session success. He expressed personal interest deliberations of the Council especially since ber of the items on the Agenda were of interest to him.

65. The observer of the *United Nation cational, Scientific and Cultural Organizati* sented on behalf of his Director-Gener greetings of that Organization and its most wishes for the full success of the 6th Sessio

66. He referred to the interest of UNE the development of research in marine biolo oceanography in the region, to the maintena contact between UNESCO and the IPFC, reproductions of Dr. Tweedie's charts on Biology for the use of students and fisherm to the Symposium on Plankton conducted by the UNESCO and IPFC, the proceed which have been recently published and appreciated.

67. He mentioned how on the basis suggestion made by the IPFC Executive mittee, a new impulse was given to the UN support in the promotion of increased resea oceanography in the Indo-Pacific regio cited the joint meetings held on the sul Manila in 1953 and in Rome in April 1954.

68. Using the opportunity of the 6th Sess the Council, UNESCO was organizing in a meeting of Representatives of Marine Institutes in the Indo-Pacific region to be fo up by a symposium on Physical Oceanograp then by a meeting of an Interim Advisory mittee on Marine Sciences.

69. In conclusion, the observer rei UNESCO's sincere greetings for the Sessi assured its full co-operation and support Council's activities.

70. The observer for the *World Meteor Organization* stressed the significance of v to fishing operations. The Organization tempting to impress upon fishing vessel op that it would be to their great advantage to cording and reporting meteorological obser The observer assured the fullest co-operation WMO in the Indo-Pacific Fisheries C efforts to improve and safeguard fishing tions.

Steering Committee

71. The Executive Committee's function Section X, paragraph 1-B, having ceased u inauguration of the 6th Session, the

tuted a Steering Committee for the conduct Meeting, consisting of the following:

airman of the Council ...	Mr. Boon Indrambarya.
mber of the Japanese Delegation ...	Mr. S. Okamoto.
airman of Technical Committee I ...	*Dr. K. Kuronuma.
airman of Technical Committee II ...	Dr. M. R. Qureshi.
mber of the Executive Committee ...	Mons. R. Serene.
ecutive Secretary of the Council ...	Dr. C. Miles.

bership

It was noted from the Executive Committee's rt that the sixteen Member Governments ned unchanged as reported at the 5th Session, iat the Observer for Portugal had submitted mmunication from his Government to the effect Portugal would shortly adhere to the Council's ement.

entials

The Secretary, in accordance with Section Rules of Procedure, submitted his Report on ntials, from which it transpired that **51 ipants were present, each of the sixteen ber Governments having sent a delegate, e which Portugal and New Zealand were re-nted by Observers, as were the Commission iational pour l'Exploration Scientifique de la Méditerranée, Pacific Science Council, South c Commission, United Nations Educational, ific and Cultural Organization and the World rological Organization.

cil's Report to FAO

The Secretary's Report to the FAO Con-ce (Working Paper No. 12), which would be ng as from 4 November 1955, in accordance he Council's constitutional obligation to report ally to the Organization, was approved. It had drawn up in brief summary form as had pre-ly been requested by the Organization, since t time all that was required was justification e disbursement of funds to cover the Council's et. Mr. Fiedler, of the FAO Secretariat, ned the Council that the Organization would y be requesting all its regional bodies to sub-iore substantial reports, including all such resolutions as might eventually require implementation by the Organization, or affect its finances in any way.

75. The Secretary was instructed to send by air-freight to Rome sufficient copies of the mimeographed Final Report of this Session so that the Director-General might be in possession of them at the time of the Conference in November.

Amendments to the Council's Agreement

76. A motion was submitted by the Government of Thailand for an amendment to the Council's Agreement, and a modification to the amendment was submitted by the delegate for France. The final wording of the motion approved by the Council was as follows:

THAT, in the Council's Agreement, the word 'meeting' be deleted wherever it occurs and substituted by the word 'session'.

THAT in Paragraph 2 of Article II, the word 'simple' between the words 'a' and 'majority' be deleted, and that the words 'except as otherwise provided in this Agreement' be replaced by the words 'except when a greater majority is required by this Agreement or by the Rules governing the procedure of the Council'.

THAT the following be added to paragraph 3 of Article II of the Council's Agreement after the full stop following the word 'Committee':

'In the unavoidable absence of one or two members of the Executive Committee from a Committee Session, the Chairman shall have the power to co-opt the chairman of one or two of the Technical Committees, which may from time to time be established in accordance with the Rules governing the procedure of the Council, at his discretion, to substitute the absent Committee member or members for that Committee Session only, provided that one permanent member of the Executive Committee shall always be present and that the number of voting members attending the Committee Session shall in no case exceed three.'

Amendment to the Council's Rules of Procedure

77. The Council considered a modification proposed by the Executive Committee to the Rules of

*Upto Tuesday, 4 October 1955 Dr. N. K. Panikkar.
** The Alternate Delegate for Korea arrived after the Report was approved by the Council, thus making a total participants.

Procedure in accordance with paragraph 3 of Section XVI of the said Rules, as follows:

THAT the word 'Meeting' wherever it occurs in the English version of the Council's Rules of Procedure, be deleted and substituted by the word 'Session' and, conversely, that the word 'Session' wherever it occurs in the existing Rules, be deleted and substituted by the word 'Meeting', EXCEPT THAT the word 'Sessions' be retained in paragraph 3 of Section XI where it refers to Sessions of the Conference, and the word 'meetings' be retained after the word 'plenary' in paragraph 4 of Section XII.

THAT, in the French version of the Council's Rules of Procedure, the essential amendments be made to conform to the above amendment of the English version, taking into account that the official translation adopted by FAO for the word 'Meeting' is 'Seance', and that the corresponding translation of the word 'Session' is 'Session'.

THAT the following definitions be added to Section I of the Rules of Procedure:

'*Session*: A properly convened continuing assemblage of delegates which may be adjourned from day to day.'

'*Meeting*: A period of a Session during which delegates do not separate except for a short recess.'

THAT in paragraph (1) of Section IX of the existing Rules, immediately after the full stop following the word 'vote' be added:

'Decisions of the Council shall be taken by a majority of the votes cast, except where a greater majority is specified in the Agreement or in these Rules.'

78. No modifications having been proposed, the amendment was adopted by 16 votes to none, thus complying with paragraph 2, Section XVI, which calls for a two-thirds majority.

Parliamentary Procedure

79. The Secretary's notes on Parliamentary Procedure, which had been requested by the Council at the instance of the United States delegation at the 5th Session, were taken as read. The delegate for Pakistan proposed the adoption of the following resolution: The Council resolves:

THAT in case the Chairman should be in doubt or is challenged on a point of order not covered by the Council's Agreement or Rules of Procedure, the parliamentary authority of the Council shall be the Rules of Procedure of the Food and Agriculture Organization, where applicable, or, where these do not apply, Roberts Rules o Revised (1943) as abbreviated in the leaf publication, 'Parliamentary Pro at a Glance', by O. Garfield Jones (ton-Century-Crofts Inc. New York).

Nomination of Technical Committees

80. The delegates proceeded to nomina members of Technical Committees I and II ensuing year (recorded inside the front cover publication).

Council Correspondents

81. The Council approved of the use ministrative Correspondents as the official g ment channel for the communication o Council's projects, and, because these Corr dents should hold regular meetings c members of the various panels in their c the Council recommended that such Correspo should be chosen from the Directorate or D ment of Fisheries of the country concerned. delegates were requested to make any change might desire in the list of Bibliographic an ministrative Correspondents.

Time and place of 7th Session

82. The time and place of the 7th C Session referred to under Agenda Item N was taken up. The delegate for Indonesia ed the invitation made by his Government th 7th Session be held in April or May of 19 Bandung, and this gracious offer was accep the Council with thanks (applause).

83. As an outcome of this item, some sion took place as to whether the Council hold its meetings at two-yearly intervals as ha suggested at previous Sessions. The delega the Philippines, Australia, India, the United dom and Indonesia believed that the C should meet every two years, but no final d was reached on this matter, it having been that this point should be taken up by the C when determining the time and place of t Session.

Staff

84. The Council commended the Secreta his Staff for the diligence with which the used official and vacation time for the furth of the Council's business, including visits to tories within the region and attendance at territorial scientific meetings which are of rel to the IPFC.

85. It appeared to the Council that the staff at the Bangkok Regional Office had to

business of the Council in addition to its mate duties as a Regional Fisheries Office. e this did not present insuperable difficulties g the early years of the Council's life, it is now ent that the increasing number of Member rnments, and the increasing number of assign- s will not permit effective coverage of the cil's present technical and administrative re- ments by the Secretariat as at present consti- . The Council recommended that considera- e given at the forthcoming General Conference e FAO to the urgent need for appointment additional officer to the staff of the Regi- Office at Bangkok.

Since the French-speaking Member Govern- s have been inadequately documented both uncil Sessions and in the intervening periods, s strongly recommended that the Organiza- eek the means whereby permanent interpreter / ation services be made available to the Regi- Office as a whole, to service all divisions both Bangkok office and in Regional Conferences.

et

The statement of the Secretariat on Budget ccounts was approved. It was noted, how- that the Printing item of $2,500 was under- by $1,000, owing to the proposed hand- not being available.

The Council considered that an expert sh/French interpreter should be provided at cil Sessions, since such a person was not y available in the host country. The il therefore recommended that provision be to this end in the 1957 budget.

It was also evident that the task of inter- g at Council Sessions was sufficiently heavy mand two persons, one of whom might be ted locally. It was therefore recommended he Council's Budget for Session expenses l be increased by $750 to provide travel ses for a non-local interpreter, plus wages ie additional interpreter on a local basis.

mentation of the 5th Session Directives

The Council is of the opinion that the itive Committee has made every effort to see the directives of the Council have been ied with, despite the partial lack of response some members of Technical Committees.

In this context, the Council would appre- prompt reply from those Governments who not communicated their assent to the request certain specialists should be instructed to on Technical Committee projects as part of their official duties. This will facilitate the co-ordination of research work within the region.

External Relations

92. The relations maintained with other international organizations, as set out in the Executive Committee's Report, was approved. The Council was concerned with the apparent lack of liaison between IPFC and UNESCO in relation to the series of meetings arranged by UNESCO in Tokyo immediately following the 6th Session, to which UNESCO had invited IPFC participants without reference to the Council. The technical aspects of the Council's relations with the UNESCO Committee and other bodies will be dealt with later in this report.

Technical Assistance

93. The Council studied a document presented by the FAO Secretariat giving a review of FAO technical assistance in the field of Fisheries, and paragraphs 73–78 of the Report of the Executive Committee.

94. The Council once again confirmed its belief in the importance of the Technical Assistance Programme of FAO to assist Governments in the full development of their natural aquatic resources, and expressed the hope that such assistance may be made more extensive in the future.

95. It was noted that the delegates of certain Governments to this Session were still concerned over the fact that it had not been possible for them to obtain badly needed FAO technical aid to assist them in their incipient fisheries programmes. It was also recorded that when the same observation had been made at previous Sessions, it had become clear that the lack of technical assistance in certain member countries was mainly due to the Governments themselves not having given sufficient priority to fisheries when framing their over-all requests for technical assistance in food and agriculture.

96. The Council, therefore, placed on record its belief that the fisheries industries are of paramount importance in the development of Government programmes concerned with food, a factor which is not always given sufficient attention by Governments themselves, and the case put forward by the fishery departments for high priority in fisheries projects was often given insufficient attention.

97. It was therefore resolved to recommend to Member Governments once again that the fisheries projects be given at least the same attention as projects in other fields at the time of compiling

requests to the Technical Assistance Board for FAO technical aid.

98. The Council also recommended to the delegates of Member Governments that on their return to their countries, they themselves should make every effort to see that their own projects were submitted to the competent UN Organization, and were not lost sight of.

99. As had been explained by the Organization at previous Sessions, FAO can in no case give technical assistance unless it receives a specific request from the Government concerned, and where requests formulated by fisheries departments are not included in the final list submitted to the Technical Assistance Board, no action whatever can be taken by FAO.

100. A statement was heard from Mr. Fiedler, who is the Officer-in-charge of Fisheries Technical Assistance at FAO Headquarters, who briefly explained the new method of programming for Technical Assistance, whereby Governments are to submit their requests directly to the respective representative of the Technical Assistance Board for their area or, alternatively, in emergency cases, to any competent FAO representative in the country concerned.

101. It appeared that, in some cases, the technical assistance given by FAO to Governments would be greatly enhanced if the Governments were to include a full statement of their detailed requirements, the lack of which has sometimes made it difficult, or even impossible, for FAO to provide adequate briefing to the expert, or for the expert himself to work properly on arrival at his assignment. It was moreover felt that it would be to the advantage of all concerned if a copy of the briefing given to the FAO experts, on taking up their assignments, could be transmitted to the responsible fishery department of the Government concerned. It was the opinion of some delegates that the experts had not, in all cases, reported regularly to the Government authorities in the country to which he is assigned, and it was resolved to request FAO to instruct all experts that such reports be sent in regularly.

102. The Council then considered the question of joint projects for technical assistance, with the participation of several countries in the region having similar problems. It was recalled that the Council had, for some years past, placed considerable importance on the possibility of embarking on joint projects, and it was hoped that it might be possible in the near future to initiate some such scheme under the joint sponsorship of several Governments.

103. In particular, the possibility of initiati projects to study the stocks of (a) *Hilsa*, a *Rastrelliger*, was considered. It was not the Government of India had requested an on Hilsa, and the Government of Tha marine biologist whose work would incl study of Rastrelliger. The Council expres hope that other countries interested in the blems, if requiring external assistance, migh similar urgent requests in order that the te assistance proposed to be given to Ind Thailand respectively might be expanded in sub-regional projects. The United Kingd appointed a marine biologist to specia Rastrelliger studies at the Singapore R Research Station.

TECHNICAL ASSISTANCE

Technical Instruction

104. Paragraphs 79–84 of the Executiv mittee's Report were considered, together v reports which have appeared on the B Fisheries Statistics Training Centre held i (Contributed Publication No. 13), and the Su Report on the Training Centre on Fish Ma held in Hong Kong in July and Augus and presented as Working Paper No. 16 FAO printed Report No. 404 on this Cent also before the Council.

105. It was noted that arrangements ha concluded for the holding of a third Fisheries Training Centre in Indonesia wh fact, constituted an expansion of the seco Culture Seminar previously held in the same during May and June in 1952 (FAO/TA No. 46, by W. H. Schuster).

106. The Council noted with satisfacti success with which these Training Centr been conducted, and the results which were becoming apparent among workers in the who had attended them. The Council was ed of the formation, by the participants Marketing Centre, of an 'Indo-Pacific Fis keting Association', and of the widespread to continue the work initiated at the Being convinced of the urgent need for in ments in fish marketing in this region, r standing the progress which has alread achieved in some territories, resolved to i the Secretary to express to the Government United Kingdom and of Hong Kong, and Director-General of the Organization, the C sincere thanks and appreciation of the e action taken to implement the Resolution pa

ouncil's 4th Session, recommending the hold- f such a Centre.

7. The Council believed that it would be ntageous if a Sub-committee on Fish Mar- g were to be formed by Technical Com- e II under Panel 'C', and Governments should vited to report to the Council, through this committee, their present and proposed plans ish Marketing Improvements.

3. It was also decided to request the Organi- to continue its efforts to foster the training h marketing commenced at the first FAO Marketing Training Centre with emphasis on ole of Government and private enterprise in narketing and financing ; co-operative organi- and management of fisheries ; the mitigation harmful effects, both to the consumer and e producer, of fluctuations in availability of ies products ; consumer acceptance of new icts ; equipment and methods in fish market gement; and fish handling processing and port.

). It was pointed out by the FAO Secre- that, as in the case of expert Technical tance, no steps could be taken by the Organi- to operate any training centre unless it were eive an offer from a Member Government as host, and to make available the necessary facilities. The Council believed that the tary should, nevertheless, take advantage of opportunities as may arise to discuss in- lly the possibility of particular governments as hosts for possible training centres to be ed by FAO in accordance with the Council's stions.

. As no such offer had been received by up to the present, the choice of a Training e and the time at which it might be held, depend largely on the nature of such an However, the Council believed that Member nments should consider the possibility of ng to act as host for a Training Centre in ries Administration, including statistics, co- ives, marketing and fishery economics and once such an offer had been received, that rganization make all possible steps to organize a Training Centre at the earliest possible if possible, in 1956, but if not, in 1957.

. It was believed that such a Training should be of three months duration, and in ll five subjects could not be simultaneously ed priority should be given to courses on ries Administration and Statistics.

. A suggestion was also accepted that the il's Secretariat should examine the possi- bility of organizing in the near future a one-year diploma course in Fisheries Administration attached to one of the universities in the region. It was hoped that for this course FAO fellowships as well as grants from various foundations might become available.

FAO World Survey of Living Aquatic Resources

113. The Council had before it a document from the FAO Fisheries Division (Working Paper No. 26), giving an account of the programme of the Division for a survey on a world scale of present knowledge of Living Aquatic Resources. The Council was informed that this survey is a programme to bring together, according to certain agreed principles, all relevant available data concerning the living aquatic resources and their environment with a view to :

(*a*) Providing a general account of these resources.

(*b*) Deducing some general conclusions concerning the theory of the survey and exploitation of resources, and the methods to be used, that would apply to individual survey projects, and would assist those engaged in such work.

114. The Council believed that such survey work should take account of all activities directed toward the discovery, description and measurement of resources, and that one of the objectives is to systematize the information which is at present being gathered. The survey programme, therefore, would be immediately valuable in assisting Governments to make full use of the information available concerning their own and comparable resources. It may also contribute to the development of theory and practice in this field.

115. The Council, therefore, offered to the FAO Fisheries Division such assistance and advice as may be requested on the gathering, compilation and interpretation of resources information.

116. The Council resolved to recommend to Member Governments their utmost interest and support in this task by supplying all available information as requested, and instructed the Secretary to afford to the Organization such assistance as may be possible to this end.

117. The Secretary was also instructed to request the Organization to inform the Council, prior to its 7th Session, of the progress made in the conduct of the survey, and particularly in the compilation of information relating to the Indo-Pacific region.

Evaluation of the Council's Work

118. The Council through a Committee of the Whole examined the Evaluation Report of its work during the past six years, paying attention to the means whereby the activities of the Council could be strengthened and made more effective in terms of the Agreement.

119. It is clear from the Executive Committee's Evaluation Report that the work performed by the Council since its formation has been extremely useful in the assembling of information on fisheries of the Indo-Pacific area. The work performed by the Secretariat in keeping essential contacts with members of the Council, in organizing its activities during and between sessions, and in the dissemination of information, has been commendable.

120. The usefulness of work already accomplished by the Council since its formation does not obscure the fact that more might have been accomplished. In fact, in the direct application of Council work to fishery development problems in the area, there have been many shortcomings. It is felt, however, that these are partly inherent in an infant organization and the procedural problems relating to Council activities have necessarily taken a large share of time both of the Secretariat and of the delegations. However, the Council has now passed that stage of development and is ready to give its full attention to its principal aims. The Council's contribution to its members would have been more effective had the response from several member countries been better.

Work of the Council during Sessions

121. At present items of a purely procedural character are taking a very large share of time allotted for Council work. There is no justification for this if it is realized that the main activity of the Council is of a technical nature. In order to achieve this, the Council resolved:

(*a*) To delegate to the Steering Committee the responsibility of taking decisions on matters of a purely routine nature without bringing them to the Council for discussion. Action taken by the Steering Committee shall merely be reported to the Council.

(*b*) That the opening statements of the delegates shall be filed with the Secretariat for distribution and not given verbally.

(*c*) That nominations of committee members, correspondents, etc., shall be made in writing and handed over to the Secretariat. This shall be considered equivalent to polling the delegates under section X (2–a) of the rules of procedure.

(*d*) Formal opening of the Council and procedural matters shall not ly take more than one day of work; if the opening is during a noon, the procedural items s completed on the forenoon follow opening session.

(*e*) That the question of suitability of t papers for publication be left to torial committee consisting of c of the two Technical Committe will act in consultation with th men of their respective panels. I is difference of opinion in the E Committee the decision of the Ex Committee shall be final. The chairmen will indicate an order of for publication. Papers not a for publication should be returne authors as early as possible.

(*f*) That as some participants at each session are usually new to Counc arrangement shall be made for formal meeting of these membe the Steering Committee at whi mechanics of Council work shall plained to them. A brief note shall also be drawn up for cir before the Session.

(*g*) That the Chairmen and Rapport Technical Committees shall be towards the end of a Session so t will continue in that office till the the next session, assuring contin work. The panel chairmen shal ever, continue to be elected at the ning of panel meetings duri Session as at present. That absence of the Chairman of a T Committee at the following Sessi Rapporteur of that committe officiate as chairman.

(*h*) Assignment notes to the Technica mittees shall primarily be the r bility of the Chairmen of the T Committees. These will be dr in consultation with the Secreta approved by the Steering Co before issue. These notes will Technical Committees and not t The Committees will meet and all assignments and distribution before meeting as panels.

(*i*) That at the end of each Session th man of the Council shall send an tory letter to the Member Gove informing them of the nomina

their representatives to offices of the Council and shall indicate that the Council expects the active co-operation and support from these nominees and their participation in the ensuing Council Session.

) That if for any reason the Chairmen of the Technical Committees are not included in the delegations, every effort should be made to secure their participation in Council work by extending invitations to them to attend the Council Sessions in the capacity of experts not attached to delegations. The Executive Committee shall on behalf of the Council make a formal request to the Organization for financial assistance for this purpose.

) To recommend to Member Governments that wherever possible each delegation should consist of at least two technically qualified persons to ensure its effective participation in the two Technical Committees, which sit simultaneously.

) To urge Member Governments to assume responsibility for effective participation by members of the panels and to accord to their nominees travel and other facilities within the country to enable them to keep in touch with developments pertaining to the subject handled by their respective panels.

n) That the report of each Technical Committee shall consist of two separate documents. The first document will be a collection of factual material relating to work carried out between Council sessions and will be circulated in advance and submitted at the beginning of the Session. This document, with the contributed publications, the technical papers submitted, and the discussions arising therefrom, will be studied by the Technical Committee concerned. The second document shall be a brief summary report to be prepared at the Session and emphasizing only the main problems, the progress achieved, the work which should be continued and the new lines of work requiring the attention of Member Governments.

between Sessions

. Of the many ways of improving Council between sessions the most effective will be the thening of the Secretariat. The Council ore resolved to recommend to FAO:

a) that Secretariat officers at Bangkok should visit the countries of the area, and contact members of the Technical Committees and Panels and the Government representatives handling fisheries.

(*b*) that at least one more technical officer who should be a specialist in subjects pertaining to Technical Committee II should be attached to the Regional Office at Bangkok.

(*c*) that increased secretarial assistance at the Regional Office be provided to give more time to the senior officers to attend to technical matters.

(*d*) that an English/French translator-interpreter should be attached to the Regional Office of FAO at Bangkok in order to meet the special requirements of countries whose official language is French.

123. Technical papers for consideration at Council Sessions should be submitted three months in advance leaving sufficient time for evaluation, processing and distribution.

Sub-Regional Meetings

124. The Council recommended that Member Governments should be encouraged to hold sub-regional meetings of workers on particular projects in neighbouring areas, between sessions, on subjects indicated by the Council. Executive Committee meetings could coincide with these meetings.

Constitution of Panels

125. The Council felt that there is need to re-distribute part of the work handled by the panels of Technical Committee I. As at present constituted Panel C of Technical Committee I handles Oceanography, Marine Biology, Crustacean and Molluscan Fisheries, Seaweeds and, in fact, all items of work which cannot be brought under Panels A and B. The arrangement is unsatisfactory. The Council therefore resolved:

(*a*) that Technical Committee I shall consist of two Panels only dealing with (i) Inland and (ii) Sea Fisheries including marine and shell fisheries.

(*b*) that a list of Experts shall be established as a consultative body, to which specialists may be co-opted by invitations extended to them by the Executive Committee (regardless of their possible membership on delegations, or official connection with the Organization). The work of this Panel shall be conducted by Consultants in the fields of Oceanography, Marine Biology, Limnology, and Freshwater Biology, who shall advise

the Council of current developments in respective fields.

(*c*) that Technical Committee II shall remain as at present constituted.

Publications and Bibliography

126. The Council noted with satisfaction the accomplishment listed in paragraphs 56-58, 60, 62-64, 67, 68, 70 and 72 of the Executive Committee's Report.

127. The Council commended the Food and Agriculture Organization on the publication of the 'FAO Year Book of Fisheries Statistics 1952–1953, Volume IV, Part I' and of 'Fishing Boats of the World', but recommended that ways and means be explored to reduce the prohibitive cost of the latter volume.

128. The Council directed the Secretariat to publish in printed form such Occasional Papers as are of permanent value, and recommended that the Council's publications should be circulated as liberally as possible to ensure adequate distribution to all workers actively engaged in fisheries research.

129. The Council expressed concern about the undue delay in the preparation of handbooks and recommended that these should be published one by one, beginning in 1956, to which end the General Editor should seek such financial assistance as is necessary from FAO. It was stressed that each handbook should be written in a lucid manner so as to facilitate translation into different languages.

130. The Council noted that money appropriated for the publication of handbooks is lapsing because the manuscripts are not ready. It was recommended that such money be utilized for the publication of other works as needed and the possibility was suggested of producing advisory pamphlets dealing with the subjects which will eventually be included in the handbooks. In particular, the need for early preparation of pamphlets on the following subjects was emphasized:

(*a*) Statistics. This should include:

(i) a definition of the minimum requirements of fishery statistics in the countries of the region,

(ii) a description of appropriate methods of collection, tabulation and analysis of statistical data,

(*b*) the handling and processing of fishery products, and

(*c*) a guiding pamphlet for the further study of the status of the middleman in the different stages of economic development of countries in the region.

131. The Council felt that the proposed book—'General Introduction to Fisheries S —would be of particular value in that this would assist in defining the problems region, and recommended that it should duced as soon as possible, in mimeographe initially, pending publication of suc volumes. It should cover as wide a field sible and the editor should consider experts in different branches of fisheries to contribute chapters, soliciting financia tance from FAO as necessary.

132. The Council agreed that, where a ments could be made, suitable volumes published elsewhere might be adopted Council's reference works, pending publica the Council's own Handbooks.

133. The Council recommended th 'Handbook on Fish Culture' by Dr. S. D be considered by the Executive Commit incorporation into the Council's handbook including, if desirable, the lectures on Fish to be delivered at the 3rd International Fisheries Training Centre shortly to be Bogor, Indonesia.

134. The Council decided to request engage a consultant to prepare a book on men's Co-operatives in the Indo-Pacific The book should contain:

(*a*) general principles of Fishermen operatives and models of their w

(*b*) description of Fishermen's Co-o Societies in the countries of the and

(*c*) appraisal, analyses and suggestions the possibilities of improvement.

135. The Council noted that the FA examining the question of bibliographic ser fisheries science. In view of the lack of for building up a bibliographic service wi region, the Council resolved to encourage i possible way the efforts being made by this respect and to request the FAO to in the Council's bibliographic needs in the p service having world coverage.

136. The Council resolved to carry following specific bibliographic activities:

(*a*) the preparation of a current biblic to be submitted regularly b country to the Secretariat as pre agreed, the Secretariat in turn the collaboration of FAO in t paration of the comprehensive bibliography,

(*b*) to request FAO to assist in the ration of an annotated bibliogra

the subject of each proposed IPFC symposium to be presented at the Symposium, and

) to instruct the Secretariat to prepare a comprehensive list of all documents containing technical material which have been published by the Council or otherwise contributed at sessions, and to maintain this list by regular supplements.

The Council expressed concern that im- t technical papers written in languages other he working languages of the Council, and in ılar those written in Japanese, were not available in translation. The Council resolved that lists of papers, for which such translations have been made but not published, should be prepared by Member Governments and submitted to the Secretariat for distribution to other Member Governments and to the FAO. It was also recommended that Member Governments should notify the Council of such papers as they consider should be translated so that the Council may bring this matter to the attention of organizations possessing translation facilities. The Council further decided to ask the FAO to make every effort to develop a translation service within its bibliographic and documentation programme.

TECHNICAL COMMITTEE II

and Gear

. The Council noted from the Review of ouncil's Work (Working Paper No. 2-A) that tivities with regard to craft and gear had been aratively less than in other fields, e.g., biology. was explained by the fact that most govern- fishery officers are trained as biologists and a specific professional interest in this subject. Council was aware of the fact that craft and are the primary tools for the capture of fish and mmended that governments might bestow er attention to engaging craft and gear ologists.

). The Council studied the assignments l at the 5th Session, together with Section 1 e Report of Technical Committee II to this on, and noted that the activities of the Panel g the intervening period did not provide a ecord of the creditable achievements actually nplished in the Region, information in respect tain member countries not having been placed e the Council and it was requested that those mments which had not sent in this information ld do so before the 7th Session.

). In particular, the Council did not agree the suggestion in the Technical Committee t that experiments involving 20 vessels and should be conducted over a prolonged d before a contemplated mechanization pro- me was started, it being the Council's view sufficient knowledge of the merits and possi- s of mechanization are now available. ner, staff members of the Food and Agri- re Organization were available for consultation FAO/ETAP technical assistance may be sted by Member Governments.

141. Some of the reports of national achievements should be abridged in future Technical Committee reports as they do not communicate essential experiences of use for other countries. In the discussion of 'Evaluation of the Introduction of Non-Indigenous Fishing Methods' of the above mentioned Report, it was felt that an additional item should have been added, to provide for an explanation in the instances where any such projects have failed.

142. The Council discussed the relative merits of pair and otter trawling at great length. Mention had been made in the Report of the fact that pair trawling in India has produced catches of about 2½ times greater than those obtained by otter trawling. It had furthermore been stated that Thailand is performing experiments on the pair trawling method. Although many factors must be taken into consideration, the final conclusion was that, provided both gears were adequately rigged and fishing operations efficiently executed, otter trawling would give the best results. This view was substantiated by statements from the Japanese Delegation.

143. Technical papers submitted to the 6th meeting of the Council were studied and discussed in detail, and much information of value was brought to light. The Council resolved that, at future Sessions, summaries of the discussions shall be recorded and appended to the respective papers in the printed proceedings. Such action would enable fishery workers, who had not been privileged to attend the Session, to obtain the maximum benefit available from these papers.

144. The largest investment in the fishing industry is in craft. Whereas gear has a relatively

short lifetime and is comparatively easily modified or replaced, mistakes in the design and construction of boats may be far-reaching, and possibly even disastrous. Experience has also shown that even well-developed fishing nations can benefit from improvement in vessel design. No papers covering this field were submitted but the Council, with great interest, noted that 'Fishing Boats of the World' (A. J. Heighway, 110 Fleet Street, London E. C. 4) had been published and studied an FAO/ETAP report to the Government of Pakistan on the mechanization of West Pakistan fishing boats.

145. The Council was informed that an interim report covering the work of an FAO naval architect in India might be ready before the 7th Session.

146. Especially in the case of craft, it was considered essential that professional drawings of the existing indigenous vessels should be available, and studied by a qualified naval architect, before any contemplated modifications are attempted. Unfortunately, there are few naval architects in the Region, most of whom are employed by large shipyards, shipowners, etc. It was considered that there was a need for specialized fishing boat architects who should be trained to assist governments in improving their local craft. The Council expressed the hope that the Food and Agriculture Organization should study the possibility of producing a suitable handbook on fishing boat design, similar to Mr. Chapelle's 'Yacht Design and Planning', from which a person with a good basic training in mechanical engineering could learn the technique of drawing small fishing boats, and that governments should consider the possibility of requesting FAO to organize a special training centre for fishing boat architects.

147. Having studied a paper presented by the World Meteorological Organization describing the current possibilities of obtaining weather information, the Council recommended governments to insure that use is made of all available information from local meteorological agencies for the benefit of fishermen. The Council also resolved to recommend to FAO that the World Meteorological Organization be informed of the interest of the fishery industries of the Region in this matter and to request that Organization to continue to encourage the local weather bureaus to keep in mind the requirements of fishing boats. The Council instructed the Secretariat to inform Member Governments of the facilities provided by the World Meteorological Organization, and of the desirability of equipping their fishing fleets with facilities for the receipt and transmis weather data.

148. It was decided that the work of T Committee II on Craft and Gear during few years should concentrate on the f phases:

(1) Improvement of craft.
  (*a*) Design and construction with c sideration of economics.
  (*b*) Propulsion and mechanized han fishing gear.
  (*c*) Safety at sea and seamanship.
  (*d*) Education of craft designers a builders.
(2) Fish finding (echo sounder, l asdic.)
(3) Improvement of gear.
  (*a*) Material (nets, preservation, etc.
  (*b*) Relative fishing efficiency of the types of gear.
(4) Relation between fishing metho craft designs.
(5) Meteorology.

149. The Council resolved that explor offshore areas for location of shrimp gro likely localities should be undertaken by Governments together with the developr suitable gear and capture techniques and Council should be kept informed at S through the Committees.

150. For the future, it would increase t of the technical discussions if papers on subjects were invited from experienced wor the recommendation of Technical Comm The papers reproduced must conform recommendations on Page 7 of the Proceed the 5th Session and in this respect, it w sidered that Mr. Takayama's Paper No. fishing with light might form a useful mo

151. The special attention of Member ments was invited to the publication 'J Fisheries' and contributed papers by J workers, and also to the Proceedings Mediterranean Fisheries Council which cont valuable material.

152. Although considerable discussio place on the assignment for the study of versus synthetic fibres for the manufac fishing gear, and information on this sub been recorded in the technical papers 'The Use of Synthetic Fibre for Fishing N Ropes in Japan' by H. Miyamoto and straw Net and Rope as Indigenous Materi S. Takayama, no conclusions were arrived Member Governments were requested to u

your to place substantial information in the of Technical Committee II, through its and Gear Panel, well in advance of the 7th n.

Similarly, the discussion on the use of sounders, not only to study depth and occa- schools of fish, but in order to study the on of fish towards fishing gear, revealed that ouncil was still lacking sufficient information e subject which was assigned to Technical ittee II (Craft and Gear Panel) for study and to the 7th Session.

. It was recommended that the Technical s 26, 48 and 51 be published in full. The il further recommended that a condensed n of Technical Paper 55 should be published ent Status of Uses of Fish Finders in Japan by wata) and that Papers, 22, 23, 24 and 25 l be postponed for consideration by the editor Handbook on Gear.

. Four papers on the subject of fishing with together with details of the reactions and ical effects that a variety of different lights upon the schools of fish, were studied. The of this joint discussion are reported on ere.

Technology

. The Council noted that, although progress field of Food Technology had been slow, evident that the Panel under the chairman- of Dr. J. R. Vickery had been the most sful in its achievements since the formation Council.

Technical papers submitted to the 6th n of the Council were studied and discussed ail. In the light of information received, it ecommended that the following papers be hed in full:

) Chemical Preservation of Marine Products by S. Tetsumoto, T. Okitsu and M. Fukuta (Japan).

) Preparation of Galongong (*Decapterus macrosoma*) Fish Meal and its Nutritive Value by O. N. Gonzales, S. V. Bersamin and J. I. Sulit (Philippines).

) Note sur la Conservation du Poisson Saleseche sous Emballage de Polyethelene by R. Lafont (Cambodia).

Although the papers recommended for tion contained valuable information both on sing and storage, the Council agreed that the ents given to the Panel at the 5th Session Council had not been completed, and it was d that the study of improved methods of processing and storing dried fish, particularly with regard to humid conditions, should be continued by the Panel. Recognizing the need for systematic investigations, it was further agreed that the work of the Panel should proceed in accordance with the following programme:

(*a*) *Analytical data*:

The customary range of moisture, salt and oil content of dried fish and salted dried fish immediately after preparation.

(*Note*: These will vary widely from region to region and should be obtained by each country producing substantial quantities of these products.)

(*b*) *Methods of preparation*:

(i) In areas where rain and dull weather often interfere with the preparation of dried fish, studies of the use of simple forms of shed drying with artificial heating.

(*Note*: These studies will probably also involve investigations on the extent to which air temperatures during drying can be raised without impairing the quality of the products.)

During the dry months, it may be possible in certain areas to test the effects of partial drying by exposure of fish fillets to the sun, and subsequently to complete the preservation by hot smoking in bins or sheds. It is understood that this process would be economically feasible in at least one area (East Pakistan).

(ii) The effects of impurities in the salt on the quality of salted dried fish.

(iii) Any other important aspects of preparation which may be peculiar to certain regions and forms of processing.

(*c*) *Keeping quality*:

(i) Careful surveys to determine the storage life of each dried fish product and to determine approximately the amount of spoilage leading to rejection; and to specify precisely the major causes of such deterioration.

(ii) For dried fish products found to have an inadequate keeping quality, experiments to vary procedures of preparation with the aim of getting better keeping quality. Such experiments might include the effects of moisture contents lower than customary. These experiments could be carried out in conjunction with experiments sugges-

ted in (b) (i) above. In products where the storage life is terminated early by the attack of micro-organisms, the incorporation of mild, relatively harmless antiseptics should be tested.

(iii) Investigations on the use of storage containers, preferably as large as possible, with the object of restricting the uptake of moisture by the dried fish and excluding insect attack. In these tests, the possible use of wrapping should be considered together with studies on the inclusion of small quantities of fumigants, such as ethylene dibromide, in the sealed containers to kill inherent insects and their eggs. Although normally expensive at the present stage of development, studies might also be made to develop stable technology of and economical methods for this type of storage.

(iv) Where economic circumstances warrant it, and where large quantities of dried fish are normally stored for considerable periods of time, conduct experiments on cold storage of the products. Since normally, the higher the temperature of storage the cheaper will be the storage charges, it would be advisable to conduct experiments to determine the optimum temperature and relative humidity for the storage of dried fish of varying moisture content. The optimum temperature is to be taken to mean the highest temperature which holds the product in a satisfactory condition for any desired period of time.

(*d*) *Standards of quality* :

Detailed information gained from the above investigations, particularly the analytical data, together with consumer preference tests, may be used to assist in drawing up standards of quality for each product. The setting up of such standards, perhaps strengthened by measures suitable to local conditions may help considerably in raising the initial quality and keeping quality of dried fish products.

159. The Council noted with satisfaction that considerable research work was in progress in many member countries and resolved to recommend to Member Governments that full support be given to the implementation of this programme and that competent workers be assigned to these du part of their full time work. It was felt th when the objects of the programme had bee achieved, should the Council turn to oth standing problems in the field of Food Tech

Socio-economics, Marketing and Statisti

160. The Council considered the history work in the field of Socio-economics and St since the 2nd Session, and recommende Member Governments should intensify their gations into the economic and social asp fisheries. It was felt that there is, at pre disproportion between the number of w assigned to the study of Socio-economi Statistics on the one hand and to the bio aspects on the other, to the disadvantage former.

161. The Council approved the Report o C (Socio-economics and Statistics) of Te Committee II for the period between the 5 6th Sessions, which reflected a valuable ex of information which should be continued. noted that several Member Governments ha tained from the work of the Panel, and th was expressed that contributions from countries would be forthcoming.

162. The Council, therefore, decided th Panel on Socio-economics and Statistics continue its work and Delegations were req to nominate members to this Panel. It was st however, that in order to achieve results, essential that members of this Panel be inst by their Governments to cooperate effecti this work during the inter-Session period.

163. The Council noted the progress re in the field of Socio-economics and Statistics by several governments in the region, and re that the work specified at the 5th Session corded in Part III of the Report of Te Committee II should be a continuous assignm the Committee during the ensuing perio follows :

(i) Advances in the collection of ad fisheries statistics, including sa survey methods in the prod phase.

(ii) Socio-economic problems affectin production, processing and distri of fisheries products ; their soluti

(iii) Advances in the development o marketing and distribution ; de ment of consumption of fisherie ducts to improve nutrition ; the of consumer tastes for non-cust products and means of influencing

v) Development of fishery extension services (i.e., the extension of scientific knowledge to the level of the fisherman and fish farmer.)
v) Significance of fish culture as an integral part of rural economy.

The following aspects of the above assign- should receive special attention during the between the 6th and 7th Sessions :

) Economic aspects of fish processing.
) Retail trade in fish products.
) Trade in fish and fish products between countries of the region.
) Income generating effects of fishing industry.
) Industrial relations in fishing industry.
) Economic aspects of air transportation of fish.
) Economic aspects of refrigeration.

It was pointed out that the study of distri- should also cover economic aspects of stor- d transportation.

tics

Advances in the Collection of Statistics :

The Council noted that the Sub-Com- on Statistics had not operated since the 4th n, and decided to merge it with the Sub- nittee on Socio-economics into one Panel to ith both socio-economics and statistics. The ommittee on Statistics, formed at the 4th n, was requested to pass on all the collected ial to the Secretariat for transmission to the int Panel which, it was hoped, would have sub- l contributions to make to the 7th Session. noted that in many countries of the region ate fisheries statistics were still lacking.

The Council recommended that in order to ve maximum utilization of shrimps, accurate ls of catches by sizes and areas of capture be ained.

economics

Problems affecting Production, Processing and Distribution :

The approach of different Member Govern- of the region to these problems as set out tion 2 of Part III of Technical Committee ort was noted.

The importance of Fishermen's Co-opera- cieties, as a means towards the improvement fishing industry, was stressed. The Council however, that there are also other forms of nic organization, in addition to co-operatives, which may lead to the improvement of the fishery industries in the region. For this purpose, the continuation of the national surveys of economic and social aspects of the fishing industry in the region was regarded as indispensable.

(iii) *Advances in Marketing and the Development of Consumption and Consumer Taste*:

170. Section 3 of Part III of Technical Committee II Report was studied and the advances in marketing practices noted.

171. It was observed that no contributions had been received from Member Governments in the development of consumer taste, except the information on fish sauce from the Philippines. It was hoped that these studies would have progressed sufficiently at the time of the 7th Session to permit of substantial contributions on this aspect. It was understood that the FAO might now be in a position to provide expert services to promote fish consumption in the region and that countries might submit requests for this type of service. The need was stressed for a better understanding of consumer taste in the region and it was felt that such expert services would contribute in no small measure to this knowledge.

172. The Council was apprised of the publication of the Survey of Fish Marketing in the Indo-Pacific Region, prepared by Mr. E. F. Szczepanik, included in the Report on the 1st International Fish Marketing Training Centre held in Hong Kong in 1954 (FAO Report No. 404) which is regarded as a valuable step forward towards a better knowledge of the fish marketing problems and of the methods of their solution. The hope was expressed that the recommendations made therein for the development and improvement of systems of fish marketing might be studied by Member Governments with a view to their adoption. It was agreed that the Survey permits of a comparative study of fish marketing practices in the countries of the region and indicates the possibilities for modification and improvement in each territory. From the point of view of the international bodies, such as FAO, the Survey clearly indicates the common problems which could be tackled by these bodies in order to formulate plans of action covering the region as a whole.

(iv) *Extension Services*:

173. Advances in the establishment of extension services as reported by Technical Committee II were noted. The Council stressed that perhaps one of the most vital activities of governments in the pursuit of fishery development is the provision of such services and that until such time as the welfare of the fisherman receives adequate attention

in the countries of the region, the productive capacity of the operatives, who are the basic factor, will remain low. The contribution of a paper on the Inland Fisheries Extension Services in Indonesia by M. Ahjar was noted.

(v) *Fish Culture in Rural Economy*:

174. The paper entitled 'The Significance of Fish Culture as an Integral Part of Rural Economy in Indonesia' was studied as was the information contained in Part III(5) of the Report of Technical Committee II.

175. It was agreed that the paper contains positive proof of the economic importance of fish culture contributing considerably towards the improvement of the fish farmers' standard of living. It was also noted that in the Indonesian experience, the solution of the fry transportation problem was particularly difficult.

176. It was recommended that the socio-economic aspects of fish culture should be included in the curriculum in the International Training Centre in Inland Fisheries to be held in Indo October 1955.

177. Technical Papers Nos. 38-40 an were studied, and the following were recom for publication:

No. 39 Progress of Fisheries Statistics by T. Yamamoto.

No. 40 Some Basic Problems in the I ment of Fisheries Statistics in J N. Oka.

No. 43 The Inland Fisheries E Services in Indonesia by M. Ahjar.

No. 45 Co-operative Marketing Orga in Indonesia by Eddiwan.

No. 46 The Significance of Fish Cu an Integral Part of Rural Econ Indonesia by M. Ahjar and R. Tasr

178. It was also recommended to Summary and Conclusions presented i No. 44, The Relative Importance of Sul Fishing by M. Ahjar.

TECHNICAL COMMITTEE I (BIOLOGY)

Indo-Pacific Fisheries Year

179. In considering a proposal put forward by Technical Committee I, the Council agreed that the position of fisheries statistics in many of the countries of the Indo-Pacific area is extremely unsatisfactory. Most of these countries do not have sufficient personnel to collect statistical data, nor standing organizations for collection and compilation of fisheries information on an adequate scale. Since the establishment of the Council the subject has been receiving increasing attention and most countries are aware of the importance of accurate statistics. The Statistical Training Centre organized at Bangkok has also given impetus to the question of training of personnel. The position of biological and oceanographic studies relating to fisheries is in a more backward state than the actual collection of statistics. In no country is it now possible to evaluate the influence of biological, hydrological and climatic conditions on fisheries. At the 5th Session, attention was drawn to the possible influence of climatic changes on marine fauna and fisheries and the need for Member Governments to collect information on the subject.

180. Collection of regular information on both these would involve co-operation of a very large team of workers and it is not likely that such a team will be available. It was therefore suggested that efforts be made to indicate specific years for the collection of fisheries and ancillary da great a detail as possible within fixed inte time. This suggestion was not to be t mean that regular collection of statistics and cal data should be shelved, but to empha need for a common and simultaneous m programme for *all* countries of the area, once in five years. From various points o will be highly advantageous if complete available for all countries for the same s year so that the fishery resources of the ar whole may be studied in relation to enviro aspects.

181. The next International Geophysic is scheduled for 1957–58 during which ocea hic, meteorological and a vast amount of da ing to various countries and oceans will be c in detail and it is likely that many countrie Indo-Pacific region and many international s organizations will be participating.

182. The Council recommended to Governments that the first Fisheries Year area should be observed at the same time International Geophysical Year so that bio fishery and geophysical data might be colle the same time.

183. It was agreed that both a basic m programme and an ideal programme

utlined. Methods for assessment of coastal ry statistics in areas with scattered communi- would be defined. A sampling technique was able from India, where the margin of error not exceed 10%.

4a. In areas where personnel were not speci- y available for collection of fishery statistics, n would have to be taken to secure the assis- of agricultural, revenue and other officers to the programme.

4b. The Council resolved to recomm end to to convene a meeting of consultants on this ct, to discuss this project in detail, the standard ods to be employed and the programme for ementation.

5. The Council emphasized that the Regional ing Centre for Fisheries Administration re- mended elsewhere in this Report, should e in its curriculum the training of those who steer the collection of statistics in each ry during the Fisheries Year in order that ilation might be uniform and readily compar-

d Fisheries

6a. The Council accepted Section 1·2 of the w of the Council's Work and Sections 2, 4 of the Report of Technical Committee I to session.

6b. The Council accepted the Hilsa report d by the Meeting of the IPFC Hilsa Sub- mittee in Calcutta in June—July 1955 and mmended that the interested governments ly Burma, India and Pakistan should colla- e in implementing research on the lines laid in that report as a co-operative project, with w to reporting progress at the 7th Session.

7. Regarding fisheries in relation to river development, the Council considered that the cations by Miles and Job (IPFC Occl. Pap., ; and by Job, David and Das (Ind. J. Fisheries 2) were valuable contributions of direct interest e region and recommended that the specific ies requirements in river basin development cts in the member countries should be syste- ily investigated, so that engineers and other development authorities might be provided positive directives to satisfy fisheries require- s. The Council also recommended that ber Governments should incorporate in their ation necessary provision to ensure the concur- of fisheries departments in the issue of es and permits for the construction of dams.

8. Concerning pollution, the Council directed work towards the assessment of the actual damage to fisheries caused by pollution and the description of effective remedial measures should be pursued further by Technical Committee I, and recommended to Member Governments the active pursuit of this line of work in the ensuing period.

189. The Council recognized the great need expressed by Member Governments for an international exchange service for fish stocking material, and directed the Secretariat to render this service.

190. The Council resolved that, in consideration of the great importance of proper feeding in productive fish culture, which had been given high priority during the FAO Conference in 1953, a comprehensive study of fish nutrition be made and papers presented at the Seventh Session.

191. The Council noted with interest the report of Mr. Van Pel of the South Pacific Commission, that Chanos was breeding in the enclosed lake of Ano Ava in Tonga and in the Peleliu fish pond in the Palau Islands, and, in view of its possible significance for Chanos culture in the region, recommended that interested member countries should explore the possibilities of investigating these cases thoroughly, if necessary with assistance from FAO.

192. The Council, having considered the note on soil composition in relation to the productivity of fish ponds presented by the Government of India, recognised the importance of substratum studies in agriculture and, in view of the undeveloped nature of this subject in the region, recommended that such studies be pursued by workers in member countries and the results made available to the Council at its 7th Session through Technical Committee I. Because of the paucity of specialists in this subject in the area, the Council requested the Government of India to provide a review of the available information on this subject.

193. The Council considered the reports placed before it by Technical Committee I on fish culture in rice fields and recommended the constitution of a joint committee consisting of Mr. H. Saanin, Chairman of the Council's Inland Fisheries Panel and a representative of the International Rice Commission, to formulate a programme of experimental research on this subject which might be pursued by interested member countries on a co-ordinated basis. The Council requested the Secretariat to establish this Committee in consultation with the Commission.

194. The Council considered the notes on the 'Control of Weeds in Fish Ponds' presented by the Government of India, and on the 'Floating Weed Menace' by the Thai Delegation, and

observed that information on the efficacy of chemical, mechanical and biological methods of the control of aquatic weeds is becoming available. The Government of India's announcement of the publication on 'The Use of Herbicides in India' by Job, Philipose and Dutta was acknowledged with interest. The Council recommended to Member Governments that their work should be directed in the immediate future towards further field studies on the effect and the economics of selected methods or combinations of methods of weed control in individual water systems infested with weeds, and that Dr. Philipose should be invited to make the results of such work available to the Council in the capacity of rapporteur on Weed Control.

195. The Council reviewed the progress in fish culture in the region and expressed its appreciation of the active programmes that are in operation. It recommended that these activities be continued.

196. The Council, in considering the question raised by the Government of Ceylon of the introduction of exotic fishes, with special reference to predators such as Black Bass, had before it the note furnished by the Philippine Bureau of Fisheries and also FAO Fisheries Paper No. 2 on 'The Problem of the Introduction of Foreign Species into Inland Waters.' The methodical procedure adopted in the case of Tilapia by the Government of India, as detailed in the report of Technical Committee I, was recommended for adoption by Member Governments with suitable modifications.

197. The Council recognized the importance of the widely distributed grey mullet (*Mugil cephalus*) both as a wild stock and as a cultivable species in brackish water in the relatively less productive regions of the world. Although little research is being conducted on the species in the Indo-Pacific, work on its biology and culture is proceeding in other areas, and it was felt that the results of some of this work might have a more general application. The Council, therefore, appointed Mr. J. D. Bromhall as rapporteur to contact workers on grey mullet throughout the world, and instructed the Secretariat to assist the rapporteur in establishing contact with other regional fisheries organizations and with FAO. The rapporteur was requested to report to the Council at its next meeting on the state of research in this field, with a view to promoting the exchange of information between interested workers and the co-ordination of their efforts.

198. The Council, having reviewed Technical Papers Nos. 1—8 recommended the publication of Nos. 1, 3, 4, 7 and 8 in full, and Nos, 2, 5 and 6 in abstract.

Sea Fisheries

199. The Council strongly urged Governments to submit reports of research promptly, as requested by the tuna rapport inclusion in the report of Technical Com and nominated Mr. Joseph King of the Oceanic Fishery Investigations to Dr. Royce as rapporteur.

200. The Council nominated a Special S mittee consisting of Dr. A. L. Tester (U.S. vener, Dr. H. Nakamura (Japan) and Mr. J (Australia) to prepare an official I.P.F.C. cha region for recording the distribution and c of tuna and tuna-like species. The char be marked off in unit statistical areas, i through a system of coding referable to and longitude. The Sub-Committee sho sider the size of the areas and the possi their further sub-division by each Member ment for local records according to a stand tem. The Sub-Committee should report the 7th Session with a proposed draft and e tion system. If these were approved, w means of duplication for the use of Member ments would then be considered. Suc would constitute an Atlas of the distrib tuna and tuna-like species in the area an be of great value for recording the cat pelagic species during the 'Indo-Pacific Year'. It could serve as a basis for stan porting on catch statistics in the future.

201. The Council was of the opinion th countries concerned in tuna fishing are themselves to the utmost of their resource furtherance of research on tuna and species. The Council noted the extensi being carried out in Japan, and urged Governments to follow the Japanese exa plotting the catch and catch rate of tuna a like fishes in their respective areas.

202. During the discussion on *age de tion* in tropical fishes, the Council heard a port of the interesting work being carried Japanese workers on the yellowfin t recommended that a more thorough stud be undertaken of methods of age determi the tropics where the usual methods are d apply. The Council recognized the work being carried out in India, Hong Kong an The Council urged other member co undertake similar investigations, and reco that the results should be presented for d at its 7th Session.

203. The Council agreed that work *trelliger* is of great importance and should tinued. It recommended that the Rastrell

mittee be maintained, each interested country inating a member, and that the Sub-Committee ld meet in 1956, in response to the invitation ne Government of Malaya, in order to finalize ogramme of research.

4. The Council noted with interest that a rt on *trawling* off the Coast of Burma had been nitted by the Burmese Delegate. It was also d that a study of the Wadge Bank trawl ries had been undertaken by Ceylon, and a rt on this fishery was requested for discussion e 7th Session.

5. The Council noted important experimental in hand in Japan on the *response of fish to* of various colours. While there was no ial danger of depletion of the stock as a result shing with lights, it was necessary to limit the sity of light used by each unit to prevent un- competition.

6. The Council thanked Dr. Panikkar for g as observer at the U.N. International Tech- Conference on the Conservation of Living urces of the Sea, and for enumerating the s of information required for a conservation ramme. The Council accepted Dr. Panikkar's rt (appended) as a guide for programmes erned with the rational exploitation of rces and their conservation.

7. The Council recommended that, at the Session, Delegates be prepared to state to what nt their resources would permit a study of productivity of the sea, preparatory to a dis- on or symposium at the 8th Session.

8. The Council recommended that Technical rs 10, 12 (including its accompanying diagrams), 8 and 52 (the title of which was to be amended ead 'Experiments with the Fish Gathering p' by N. Kawamoto, with suitable alterations e text) be published in full. The Council that Technical Paper 9 was not sufficiently lete for publication at this stage. It was rstood that Technical Paper 11 would be shed elsewhere in due course, and that nical Paper 13 did not come within the terms ference for publication. The Council recom- led that a non-controversial abstract of nical Paper 54 be published and that Tech- Paper 50 and Working Paper 25 (A Review urrent Knowledge of Rastrelliger) be referred e Rastrelliger Sub-Committee.

ellaneous Fisheries

9. The Council considered that section 1•3 35 of the Executive Committee's Evaluation Report represented a reliable summary of the work achieved in the field of Miscellaneous Fisheries, since its inception. It was noted, however, that the range of responsibility of the Miscellaneous Fisheries Panel is too wide for it to operate effectively, and it was decided that Technical Committee I should constitute a Consultative Body on oceanography, marine biology, limnology and fresh-water biology in its stead, as is reported elsewhere. This Panel would accept asssignments from Panels A and B of Technical Committee I and, if desirable, from Panels of Technical Committee II for consideration in an advisory capacity, but would not itself have any continuing assignments.

210. The Council decided that the fields of *oceanography and limnology* should be part of the marine and inland fisheries programmes of Member Governments. The collection of oceanographic data will be suspended as a continuing assignment, and only such oceanographic investigations as can be related to the work of the Panels on Inland and Sea Fisheries in the sense outlined in contributed Publication No. 8, will be assigned to this item.

211. The study of *plankton* associations in Japan demonstrated a considerable breadth of knowledge of the phytoplankton but indicated that there are still some gaps in the identification of certain groups which had been collected. The Council therefore urged the UNESCO to aid in the development of a vigorous continuance of marine taxonomic studies, especially in the smaller plankton and phytoplankton groups, which are often valuable identifications of water masses.

212. With regard to the recommendations of *Plankton* considered by the Council at the 5th Session, for the standardization of plankton collecting gear as a long-range programme, it was resolved, as an immediate measure, to appoint Dr. Nakai as rapporteur and to direct the Secretariat in collaboration with him to select and provide for use by Member Governments suitable metered zooplankton and phytoplankton nets for oceanic surveys which could be used to calibrate the existing plankton nets of the area.

213. Referring to the forthcoming UNESCO meeting of Indo-Pacific regional institutions concerned with oceanography, scheduled to take place immediately following the Sixth Session, the Council, aware of the absence of any oceanographic institute or centre in many of the member countries, which can properly represent the interests of these countries, requested Dr. N. K. Panikkar, observer for the Council, to sponsor the needs of those countries at the UNESCO meeting.

214. The Council, as an international regional body responsible for the satisfactory development of an oceanographic programme in relation to fisheries, while recognizing the long-term need for considerable expansion of both the fundamental and fishery oceanographic programmes of the region, would view with misgivings any divorcement of the existing oceanographic facilities, inadequate though they may be at present, from fisheries research and development programmes.

215. Oceanographic institutions now emphasize geophysical sciences. In some countries they are financed by military agencies and their results therefore are not wholly available to civilians. Fishery research agencies must emphasize biological oceanography, in which the complex relations of hydrography to biological productivity must be elucidated. The problems of fishery hydrography cannot be solved merely by correlating physical oceanographic phenomena with abundance and distribution of fishes.

216. In general, fishery hydrographic studies must be conducted by fishery agencies, with hydrographic and fishery work carefully co-ordinated. At the same time geophysical oceanographic institutions are of essential value to fishery institutions in the developing of techniques, in conducting fundamental studies of physical oceanographic processes, and in training men to carry on oceanographic research.

217. UNESCO includes oceanographic research within the scope of its activities, while FAO concerns itself with fishery hydrography. There is thus some overlapping and some confusion as to the boundaries of each. The Council therefore recommended that FAO and UNESCO should seek a clear definition of the field of each organization's activities so as to avoid the present apparent duplication of effort.

218. The Council reiterated its endorsement of the views expressed in the report of Technical Committee I on the oceanographic needs of the region which was presented to the meeting of experts held in Manila in November 1953. It recommended that primary consideration be given to oceanographic training at two levels for the Indo-Pacific region. For those countries with existing oceanographic programmes, the need is for post-graduate training, which could be carried out in overseas countries. For countries with no existing oceanographic programme, the need is for persons with a local training in the basic techniques, methodology and theory of oceanography, with particular application to the fishery problems of his country.

219. The question of *possible faunal* *due to modification of world climate* was befo nical Committee I during the period under in accordance with the assignment at the 5th The Council is aware that certain Member ments have replied to the request for data upon the possible relation between meteor oceanographic and faunal changes and m tions in their environment. Technical pa and 21 from the Japanese region, and T paper 42 from the United States, appear to evidence on certain long-term changes in graphy and associated fauna and flor Council instructed the Secretary to draw th tion of Member Governments to this info for consideration by those scientists of pective countries assigned to the task, request that information be provided Council as it might become available.

220. The Council noted that the Fisher sion of FAO has been unable to obtain unp information on possible climatic changes countries outside of the Indo-Pacific regi requests that any such information be obta possible, in advance of the 7th Session.

221. The Council commended the wor World Meteorological Organization as to the Session in a paper entitled ' The the World Meteorological Organization in ing weather information for fishermen ' a of great potential value to fishery scienti

222. In the field of *Seaweeds*, the Council to appoint Dr. S. Sudo as rapporteur, and mended a more detailed study of seav sources and their utilization by Member ments during the ensuing period.

223. In the field of *Crustaceans*, the Symposium held in connection with the 5th and the recommendation arising therefro contributed considerably to an appreciati possible development of this potentia fishery.

224. The Council considered the repor Prawn Symposium and resolved :

(*a*) To request Japan and Australia the Council fully informed of in the investigations being ca into the relationship between rai other meteorological factors in to prawn yield.

(*b*) To request Japan to keep the informed on the important progress on the rearing of praw controlled conditions from egg and the culture of Skeletone feeding the larvae.

c) That Professor Kubo of Japan be asked to prepare an illustrated standard field key for the region, and to request Member Governments to supply duplicate specimens of prawns and shrimps for his use in this work.

. In the field of Taxonomy, the Council sted the F.A.O. to prepare and make avail- n up-to-date and, as far as possible, complete common and scientific names of fishes and aquatic organisms. This is necessary for ng out the work in the Indo-Pacific Fisheries The Chairman of Technical Committee I requested to re-draft the assignment on nomy and present it at the 7th Session.

. The Council recommended that Technical s 16, 17 and 21 which relate to a specific ment of the 5th Session on climatic changes, orthy of publication. Technical Paper No 19 d also be published, if possible, as it ates the role detailed phytoplankton and nkton studies can play in the identification ter masses.

re

. The 6th Session was closed in a ceremony took place at the Sankai Kaikan Hall at hours on Friday afternoon, 14 October

. On a motion by the Delegate for India, ouncil adopted a resolution as follows :

That the Council records its grateful appreciation of the spontaneous hospitality and numerous facilities which have been so graciously extended by the Government and people of Japan to the Council, and to the Delegations of Member Governments and other participants attending the 6th Session, and that this expression of appreciation be formally communicated by the Executive Committee.

. On a motion by the Indonesian Delegate, lution was passed to the effect :

That the Council expresses its thanks to Their Excellencies Mr. Mamoru Shigemitsu, Minister of Foreign Affairs, Mr. Ichiro Kono, Minister of Agriculture and Forestry, and Mr. Mamoru Hirakawa, Vice-Minister of Agriculture and Forestry, for the cordial welcome extended by them to the Delegates of the Member Governments, Observers and all others attending the 6th Session of the Council.

230. The Delegate for Pakistan proposed, and the Council adopted, a resolution as follows :

That this Council extends its deep gratitude to the Director of the Fisheries Agency and the various officers who, through their untiring care and solicitude, have contributed so much to the smooth working of the Council's 6th Session, and to the personal comfort of the Delegations.

231. The Delegate for the United Kingdom then proposed, and the Council adopted, a hearty vote of thanks to Nai Boon Indrambarya, under whose chairmanship the proceedings of the Session had been so successfully conducted.

232. The Alternate Delegate for Thailand also proposed, and the Council adopted, a vote of gratitude to the Director General of the Food and Agriculture Organization for his continued interest in the Council's affairs, and for the valuable assistance rendered at this Session by the secondment of senior officers from FAO Headquarters who have so ably assisted the Council in its deliberations.

233. The Delegate for Korea proposed, and the Council adopted, a vote of appreciation of the services of the Council's Secretariat for the manner in which it had carried out the instructions of the Council since the 5th Session, and its efficiency in servicing the 6th Session.

234. At the request of the Chairman, Dr. Cecil Miles, as Regional Fisheries Officer of FAO, expressed, on behalf of the Director General, his gratification that the 6th Session of the Council had reached a satisfactory conclusion, and had performed so much useful work directed towards fisheries development as a source of food, in a relatively short period. He also hoped that the work of the Council would continue along these lines, which the Organization would follow with keen interest, and with every possible support.

235. The Chairman introduced His Excellency Mr. Mamoru Hirakawa, Vice-Minister of Agriculture and Forestry of the Government of Japan, who extended his hearty congratulations on the conclusion of a successful session, and expressed his thanks for the Council's willing co-operation during the fifteen days of the Session. He believed that the Session had made a significant contribution to the advancement of the fisheries policy of the Member Governments, and to the furtherance of the exchange of information between countries, and he hoped that these efforts would continue in the future. He confirmed the desire of the Government of Japan to assist Delegates in every way in

their inspection tours, which will take place immediately after the Session, and hoped that it would benefit from these excursions, and carry away delightful memories of Japan. Thereupon he declared the 6th Session of the Indo-Pacific Fisheries Council adjourned.

In addition to the heavy schedule of work accomplished by the Council during fourteen plenary meetings and the numerous meetings of the Committees and their Panels, the following receptions were attended by Delegations:

Reception by the Honourable Minister of Agriculture and Forestry.
Theatre party by Japan FAO Association.
Tea party by the Delegate for India.
Garden Party by the Metropolitan Governor.
Reception by the American Delegation.
Reception by the Director of Fisheries Agency.

Excursions were made, by courtesy of the Japanese Government, to the Tokyo Metropolitan Fish Market, the Tokai Regional Fisheries Research Laboratory, the Tokyo Municipal Fisheries Experimental Station, Tokyo University of Fisheries, and Misaki Fishing Port. Two optional post-conference five-day inspection tours were also arranged to:

A. Tokyo-Bentenjima-Kashikojima-Nara-Tokyo.
B. Tokyo-Kyoto-Kashikojima-Nagoya-Gamagori-Shizuoka-Tokyo.

The following films were also shown participants and visitors on two evenings:

HAWAIIAN TUNA PACKERS (Honolulu), courtesy of the United States Delegation ... 25
FAMILY AFFAIR (Tilapia Culture in the Philippines), courtesy of the Philippine Delegate ... 15
IMPERIALEN 00000 (Oyster Culture in the Netherlands), courtesy of the Netherlands Government ... 35
THE QUIET VILLAGE (Fisheries Extension Work in India), courtesy of the Indian Delegate ... 20
SQUID FISHERY, courtesy of Kita Nihon Eigasha Corporation, Japan ... 30
SET NET FISHERY IN ODAWARA CITY, courtesy of Odawara Fishery Management Society, Japan ... 20
SHRIMP (Fishing Gear and Methods), courtesy of Dr. M. Fujinaga, Japan ... 17
TUNA FISHERY, courtesy of Eiga Nihonsha Corporation, Japan ... 17
SKIPJACK FISHERY, courtesy of Eiga Nihonsha Corporation, Japan ... 2

INTERNATIONAL TECHNICAL CONFERENCE ON THE CONSERVATION OF THE LIVING RESOURCES OF THE SEA.

Rome, *April—May* 1955

REPORT BY N. K. PANIKKAR

vernments of 45 countries were represented above Conference which was convened by ecretary-General of the United Nations in dance with the General Assembly Resolution 00 (IX) adopted on 14 December 1954 which as follows :

General Assembly

sidering that the International Law Com- on has proposed for the consideration of the al Assembly draft articles[1] covering certain aspects of the international regulation of ies, and considering also that that Commis- has not yet concluded its study of related ion,

ving regard to the fact that the problem of ternational conservation of fisheries involves rs of a technical character which require deration on a wide international basis by ied experts,

ing of the opinion that an international ical conference should be held in the near to consider the problems of fishery con- tion and make recommendation thereon,

calling that, by resolution 798 (VIII) of 7 mber 1953, the General Assembly, having d to the fact that the problems relating to the seas, territorial waters, contiguous zones, continental shelf and the superjacent waters osely linked together juridically as well as cally, decided, consequently, not to deal with spect of those topics until all the problems ved had been studied by the International Commission and reported upon it to the al Assembly,

ving regard to the fact that the technical s relating to the conservation, protection and ation of fisheries and other resources of the re also closely linked to the solution of the ems mentioned in the preceding paragraph,

Requests the Secretary-General to convene ternational technical conference at the head- quarters of the Food and Agriculture Organization of the United Nations on 18 April 1955 to study the problem of the international conservation of the living resources of the sea and to make appropriate scientific and technical recommendations which shall take into account the principles of the present resolution and shall not prejudice the related problems awaiting consideration by the General Assembly ;

2. *Invites* all States Members of the United Nations and States Members of the specialized agencies to participate in the conference and to include among their representatives individual experts competent in the field of fishery conservation and regulation ;

3. *Invites* the interested specialized agencies and inter-governmental organizations concerned with problems of the international conservation of the living resources of the sea, to send observers to the conference ;

4. *Requests* the Secretary-General to arrange for the necessary staff and facilities which would be required for the conference, it being understood that the technical services of Governments of Member States and the technical and secretarial services of the Food and Agriculture Organization shall be utilized as fully as practicable in the arrangements for such a conference ;

5. *Requests* the Secretary-General to circulate the report of the conference for information to the Governments of all States invited to participate in the conference ;

6. *Decides* to refer the report of the said scientific and technical conference to the International Law Commission as a further technical contribution to be taken into account in its study of the questions to be dealt with in the final report which it is to prepare pursuant to resolution 900 (IX) of 14 December 1954.'

At the invitation of the Chairman of the Indo-Pacific Fisheries Council, Mr. Milton Lobell and I attended this Conference as observers on

[1] See Official Records of the General Assembly, Eighth Session, Supplement No. 9, document A/2456, paragraph 94.

behalf of the Council. This participation was in addition to our own individual assignments. No special statement or report on behalf of the Council was called for by the Conference. The formation of the Council, its main objects and membership have been mentioned in the final report adopted by the Conference.

The final report adopted by the conference is an extremely valuable document and will already be before the Member Governments. So far as the work of the IPFC is concerned, the sections of the report deserving special attention are those dealing with types of information required for a fishery conservation programme and types of conservation measures applicable in a conservation programme. These facts are generally known to all fishery biologists, but they have been very clearly classified and enunciated. The problems have been critically examined in a series of background papers by eminent fishery scientists. Many countries of the Indo-Pacific area are just beginning to undertake researches dealing with their fishery resources. In the formulation of such research programmes, those sections of the report which would be useful are reproduced below :

TYPES OF SCIENTIFIC INFORMATION REQUIRED FOR A FISHERY CONSERVATION PROGRAMME

1. Effective conservation of any resource of the sea requires scientific information, which is based on statistical records of the amount and kind of fishing and of resulting catches, and on integrated research on the biology and conditions of existence of the resource. It is therefore essential that any nation engaging in sea fishing collects adequate statistical records of fishing effort and catch, and it should also conduct pertinent biological and other investigations, to serve as a basis of ensuring the conservation of the resource being exploited. Since both the determination of the need for conservation measures and the selection of adequate and effective measures often depend on having data over a long period of time, it is most desirable that adequate records be collected, and biological and other research be conducted from the beginning of the development of a fishery.

2. Scientific information is required in order to provide answers, for a given fishery resource, to the following problems :

(*a*) Whether regulation of the amount, manner or kind of fishing may be expected to produce desirable changes in the amount of the catch or its quality? (It is tant to determine whether the a manner and kind of fishing is s regulation would maintain or i the quantity or quality of the able catch, because only in this the application of regulatory m indicated. In order to make determination it is often neces consider also the fluctuations in population resulting from the e environmental factors unconnect the amount, manner or kind of

(*b*) If conservation measures are in what particular measures sho adopted to produce the effects d

(*c*) What measures, other than con the amount, manner or kind of can be undertaken to impro quantity or quality of the catch?

3. The scientific information requir include some or all of the following types :

(*a*) Extent of separation of the fish source into independent or se pendent populations, which c the natural biological units of source to be dealt with by a c tion programme.

(*b*) Magnitude and geographic range populations constituting the reso a basis for conducting effective investigation and regulation, sin need to be applied over what areas are occupied by the popul be conserved.

(*c*) Pertinent facts respecting the life (such as growth, mortality rates tion, recruitment, etc.) ecology our and population dynamics species constituting the resource ing fluctuations in abundance an tions in distribution and behavio are due to changes in the b abiotic factors of the environm which are independent of the a fishing ; and including the inter ships of the community of orga which the exploited species form

(*d*) Effects of the amount, manner of fishing on the resource and quantity and quality of the su average catch to be obtained fro

(*e*) Relationships of the resource species which are members of ecological community and a exploited simultaneously by fishing equipment.

The degree of elaboration of the scientific igations required to solve the conservation ems presented by particular resources, or in ular areas of the sea, is extremely variable. ne cases quite simple investigations will be ate to determine the need for application of rvation measures, and to indicate appropriate ures to be applied. In other cases very detailed xtensive investigations will be necessary. The rements of each case must be determined on fic evidence.

PES OF CONSERVATION MEASURE APPLICABLE IN A CONSERVATION PROGRAMME

Several general types of measures may be d in a conservation programme, under each ich there are several specific types of measures may be used, depending on the nature of source and the way in which it is harvested :

a) Regulation of the amount of fishing, to maintain or to increase the average sustainable catch, by :
  (i) Directly limiting the amount of the total catch by fixing a maximum annual catch.
  (ii) Indirectly limiting the amount of the catch by closed seasons and closed areas, or by the limitation of fishing gear and ancillary equipment.

b) Protection of sizes of fish, the conservation of which will result in a greater average catch or a more desirable quality, by :
  (i) Regulation of fishing gear to achieve differential capture of specified sizes.
  (ii) Prohibition of landing of fish below a specified size, and requiring their return to the sea alive, if technically practicable.
  (iii) Prohibition of fishing in areas where or seasons when small fish predominate.

c) Regulations designed to assure adequate recruitment :
  (i) Control of the amount of fishing by any of the means under (*a*) to ensure adequate spawning stock.
  (ii) Differential harvesting of different sizes of fish, by any of the means under (*b*) to lower the fishing rate on immature fish.
  (iii) Prohibition of fishing in spawning areas or during spawning seasons.
  (iv) Preservation and improvement of spawning grounds.
  (v) Differential harvesting of sexes to achieve a desirable sex ratio in the population. (This type of measure is not generally applicable, but has been applied to some crustaceans, mammals and fishes.)

(*d*) Measures for improvement and increase of marine resources.
  (i) Artificial propagation.
  (ii) Transplantation of organisms from one biogeographical area to another, with due precaution against adverse effects.
  (iii) Transplantation of young to better environmental conditions.

2. The determination of which of these measures should be applied in a given conservation programme will depend on the details of the life history, ecology, population dynamics, and behaviour of the species constituting the resource and on the technical nature of the fishing. The efficient application of conservation measures requires adequate prior scientific investigation of these matters. Recommendations for regulations should be made only on the basis of such investigations.

It has been clearly stated in the report that, for several Indo-Pacific fisheries, inadequacy of scientific and statistical data makes it difficult to suggest conservation measures at present. In these fisheries, it has been recommended by the Conference that scientific information required for a fishery conservation programme as indicated above be gathered on a continuing basis both at national levels and by co-operative research projects at international levels, wherever that is necessary.

RECOMMENDATIONS RELATIVE TO DATA FOR COLLECTION DURING THE INDO-PACIFIC FISHERIES YEAR

Indo-Pacific Fisheries Year

A minimum programme for the Indo-Pacific Fisheries Year should include the following fishery data in respect of each country.

A. Fisheries Statistics

1. Total fish production of a country computed regionally by suitable sampling techniques or by total enumeration where possible.

2. Total fishing population (with separate figures for active adult fishermen).

3. Fishing craft and gear employed in fishing and their distribution.

4. Break up of fish landings—indicating the major commercial species and types of fishing techniques employed to enable computation of catch-per-unit of effort in respect of total production and in respect of the major commercial species.

5. Temperature and salinity cycles of inshore waters.

In the field of inland and other culture fisheries, the following may also be added:

1. Total inland fisheries production showing separate figures for yield of ponds, rivers and lakes and catch composition according to
If possible, also separate figures as at 4

2. Area of culturable inland waters.

3. Yield per acre under natural and conditions.

In addition to the above, the followin mation should also be desirable.

B. Meteorological Information

Regionwise data on rainfall and majo tic factors.

C. Oceanographical Information

1. Data on temperature, salinity and nu

2. Data on total plankton production t an estimate of the productivity of the sea different regions of the Indo-Pacific.

3. Identification of water masses with to their association with particular t fisheries.

4. Information of principal constitu marine fauna and flora collected with a comparing the results of surveys to be subsequent years.

PORT OF THE EXECUTIVE COMMITTEE TO THE SIXTH SESSION

ership

The sixteen Member Governments adhering Baguio Agreement under which the Council stituted, remain unchanged as set out in r's report.

gs

The Executive Committee has met on four s since the Fifth Session of the Council vas held in Bangkok between January 22 ruary 5, 1954, as follows :

h Meeting at Bangkok, Thailand, February 6, 1954.

h Meeting at Bogor, Indonesia, June 11–17, 1954.

h Meeting at Kandy, Ceylon and Mandapam Camp, South India, March 24–28, 1955.

t Meeting at Tokyo, Japan, September 28–29, 1955.

part from attendance at the above com- meetings, the Secretary performed the g travel :

June 1954, in conjunction with the 19th Executive Committee Meeting, to inspect Chanos and other fisheries in North Java nd Bali.

July 1954, to open the FAO Fish Market- ng Training Centre in Hong Kong.

July 1954, to attend the 6th Meeting of the nternational Whaling Commission in Tokyo nd to discuss the preliminary arrangements or 6th Council Session.

September 1954, while on home leave, to isit several fisheries institutions in the Jnited States and South America.

October 1954, while on home leave, to ttend the 3rd Session of the General isheries Council for the Mediterranean in Ionte Carlo, Monaco and visit FAO Head- uarters.

January 1955, to assist the Secretary- eneral of the United Nations in representa- on of the Chairman at a Meeting of Experts draft the agenda for the International eeting for the Conservation of the Living esources of the Sea, with consultations in pan, Hawaii and India en route.

pril 1955, after the 20th Executive Com- ittee Meeting, to Travancore, Cochin, Madras, Calcutta (India) and Rangoon (Burma).

In July 1955, to Noumea, New Caledonia, to attend the 8th Meeting of the Research Council of the South Pacific Commission and make arrangements for a proposed FAO Training Centre for Pacific island fishermen, with discussions in Sydney (Australia) and Singapore en route.

In July 1955, Dr. T. J. Job, Technical Secretary, travelled to Calcutta to attend the session of the Hilsa Sub-Committee.

4. The Council was represented at the International Meeting for the Conservation of the Living Resources of the Sea organised by the United Nations in Rome from April 18 to May 10, 1955, by Dr. N. K. Panikkar (India) and Mr. M. J. Lobell (United States).

Membership of Executive Committee

5. Some difficulty was experienced at the 20th Executive Committee Meeting held at Kandy, Ceylon, in March, 1955, owing to the absence of two of the three members from their duty stations. The meeting was eventually held with only two voting members present, plus the secretary as ex-officio member without a vote, but up to the last minute there was a possibility of the Chairman only being able to attend.

In view of the great importance of ensuring the continuing work of the Council between Sessions, the Executive Committee has recommended, and the Government of Thailand has consented to propose at the 6th Session, an amendment to the Agreement whereby the Chairman would be empowered to co-opt the chairman of one or two of the Technical Committees to substitute for regular members unable to attend a meeting of the Executive Committee.

Staff

6. The salaries of the Secretariat staff have continued to be paid by F.A.O. under Article VI of the Council's Agreement. The present permanent staff consists of Dr. Cecil Miles, Secretary, Dr. T. J. Job, Technical Secretary, and Miss A. Jiannee, Conference Officer, clerical assistance being provided from the pool of the F.A.O. Regional Office.

Budget and Accounts

7. All expenses incurred on behalf of the Council apart from the salaries and wages above

mentioned are borne from an annual budget set aside by F.A.O. The budget allocations for 1954 are shown below alongside the actual expenditure:

	Expenditure US $
A. Executive Committee Travel	...
IPFC 1st 1954/55 Executive Committee Meeting, Bangkok, Thailand, February 1954	...
IPFC 2nd 1954/55 Executive Committee Meeting, Indonesia, June 1954—expenses of Chairman, Vice-chairman and Member ...	1,800.67
	1,800.67
B. Printing	...
5th Session Proceedings—Sections I, II and III—printing, binding and distribution performed in 1954	1,244.82
5th Session Symposium—proportionate charges in excess of UNESCO contribution of $500 (1700 copies)	102.20
Current Affairs Bulletin Nos. 12–14	59.77
Letter heads and sundries	37.32
FAO Information Office, New Delhi—miscellaneous and mailing expenses incurred by IPFC	80.31
	1,524.42
C. Meeting	...
Expenditure for 5th IPFC Session, Bangkok, Thailand, January/February 1954—interpretation and incidental expenses ...	538.13
	538.13
D. Miscellaneous	...
Postage and telegrams	406.03
Stationery and supplies	254.14
Equipment	274.82
	934.99

8. The budget allocation for 1955, in respect of which the accounts are not yet closed, are

	U.S. $
A. Executive Committee Travel	2,000
B. Printing	2,500
C. Meeting expenses	750
D. Miscellaneous expenses	1,000
	6,250

The budget allocation for 1956, subject to val of the Conference of FAO, is identical hat for 1955, except that in case no Council n is held in that year, Item C would be ated, leaving an available total of $5,500.

Since it is unlikely that a Council Session e held early in 1956, the Council may to make recommendations at the 6th Session ect of the proposed budget for 1957, for sion to the Director-General in accordance Section XI(2) of the Council's Rules of lure.

mentation of 5th Session Directives

The Committee presents the printed Pro- gs of the 5th Session. The following res have been taken during the period to that all government workers assigned to il projects were fully aware of their obli- s. The degree of success achieved is not at t known and will become apparent upon the tation of the reports of Technical Com- s I and II at the 6th Session.

The names of all chairmen of committees, and sub-committees, were circulated on ary 23, 1954 with the request that retiring en pass on all pertinent records to the new en.

On March 4, 1954, Member Governments apprised of the names of all workers ated by delegations at the 5th Session to ute the Council's technical committees and iary groups. It was emphasized that the s of the Council's work would depend largely ergetic committee work and the meeting er of workers at the national level. (English rench).

On March 23, 1954, Governments were to present the review of the value of the l's work and the tangible results thereof ted by the Council at its 5th Session. A ler was sent through Administrative Corres- nts on April 21, 1955.

On June 23, 1954, the Chairmen of Techni- mmittees I and II and of the newly formed es Development Group were advised to take of the work of their groups as one-third of ne available had elapsed. It was suggested ey should now formulate specific pro- es where the Council's directives had been neral nature.

On the same date governments were ed, through Administrative Correspondents, irm their instructions to certain specialists to work on Council committee assignments as part of their official duties.

17. On November 11, 1954, the constitution of all the Council's committees, panels and sub-committees was reiterated to Member Governments so that they might convey the necessary instructions to these workers regarding their Council assignments.

18. On February 2, 1955, Member Governments were invited to participate in the 6th Session. Attention was drawn to the importance of continuing committee work by country workers and of the presentation of technical papers corresponding to the 21 assignments at the 5th Session which, if merely descriptive or academic, should be preceded by a statement of the value of the work to the Council. (English and French).

19. On February 14, 1955, all chairmen of committees, panels and sub-committees, were reminded of the continuing nature of the Council's work and asked that information be given to Chairmen of Technical Committees I and II as to the nature of the work being pursued in respect of each of the 21 Council assignments, throughout the region; the problems remaining to be solved, and suggestions for future lines of investigation. Additional information too lengthy for inclusion in a condensed report were invited as technical papers, which would constitute a real attack on the problems.

20. On May 16, 1955, attention was drawn to need for response from members of Miscellaneous Fisheries Panel.

21. The provisional agenda of the 6th Session was sent to Member Governments on April 29, 1955, and two additional agenda items proposed by Member Governments were communicated on August 1, 1955.

22. On May 16, 1955, members of all committees, panels and sub-committees were requested to submit reports forthwith as only four months remained until the 6th Session. They were to state the manner in which the Council's recommendations had been implemented, the progress of research on Council assigments and specify the outstanding problems for the Council's study during the subsequent period.

23. On the same date, members of the Inland Fisheries Panel were especially reminded of their general responsibilities to review achievements and recommend the future work programme.

24. Members of the Sea Fisheries Panel were asked, on June 2, 1955 (on behalf of the Panel Chairman) to report on their seven assignments, as only

one reply had been received, and that a negative one. It was emphasized that methods of approach and results obtained should be brought out in related technical papers.

25. The document 'Review of the Council's Work' prepared by the Executive Committee on the Council's instructions at its 5th Session, together with the reports submitted by eight governments and including a critique of the working of the Council's committees was circulated on August 17, 1955 to all governments, through Administrative Correspondents as well as to the known delegates to the 6th Session.

26. In addition to the above requests which are of a general nature, reminders were sent regarding the following specific projects.

Inland Fisheries

February 18, 1954. The Governments of Burma, India and Pakistan were requested to signify if they favour the establishment of an international co-operative research unit and, if so, whether they contemplate approaching FAO. (Only the Government of Burma has replied in the affirmative to both questions).

March 12, 1954. Council Resolution No. 3 on water pollution communicated to governments recommending assignment of competent scientific workers.

March 12, 1954. Resolution No. 4 on necessity for joint surveys by engineers and biologists, reports to 6th Session, in respect of river development projects.

March 18, 1954. Government action requested on further Council decisions; fish fry exchange, optimum densities and combinations and 'the food and feeding of fishes'. On April 26 Administrative Correspondents were asked to ensure reports reaching Panel chairman before June 15, 1955.

May 16, 1955. Panel members informed of FAO agenda item for 6th Session on Fish Culture in Rice Fields. It was assumed that joint work of agriculture and fisheries departments recommended by International Rice Commission was already under way. Further background information sent on May 20.

Sea Fisheries

February 24, 1954. Governments asked to appoint workers to Rastrelliger Sub-Committee (Resolution 6). Many subsequent communications regarding the projected meeting of this group.

March 18, 1954. Council's recommen
Tuna communicated.

Miscellaneous Fisheries

March 11, 1954. Resolution No. 2 on
world climate communicated to
ments with request that work be co
(English and French). On Oc
panel was apprised of desire
governments for a specific question
December 21 certain governme
requested to supply information o
outside the region.

March 22, 1954. Attention of gov
drawn to research programme o
leading to symposium. Outline of
headings sent on October 13, 1954.

November 22, 1954. Information c
publications relating to work given

April 18, 1955. Executive Committee
concern over lack of action by
Governments on repeated recomm
on recording of oceanographic
requested action through Admi
Correspondents. A number of fixe
suggested.

Craft and Gear

March 22, 1954. Regarding research
and gear used in the prawn fisherie
to the Symposium.

Food Technology

March 22, 1954. Attention of gov
drawn to research on processing
leading to the Symposium.

Socio-economics and Statistics

June 29, 1954. Relative importance
tence fishing suggested as suitab
for research of panel in preparatio
Session.

July 12, 1954. Panel reminded of obl
study the significance of fish cultu
economy.

Technical Committees

27. It is suggested that the effectiven
Council's technical committees as a res
reorganized programme adopted at the 5t
be discussed by the Council in the lig
above Secretariat action, the resulting re
to be received, and the evaluation report
as a separate document.

ıcil Correspondents

The Executive Committee has, during the nt period, adopted the policy of addressing Council's Administrative Correspondents as fficial government channel through which the cil's projects should be communicated. In cases, these correspondents have complied their obligation to pass such matters on to ompetent authority concerned and to commue the result to the Council, either through the tariat or through the technical committee con-d, as appropriate.

Administrative Correspondents have, more- in a few countries, complied with the cil's suggestion that they should hold regular ngs with the Council's panel and sub-com-e members in their territory in order to e that the sub-committee members are, in engaged in the Council research projects sted to them and that they maintain effective ct with their respective chairman. It is not, ver, known to what extent the panel and sub-nittee members have maintained such con-and it is suggested that the technical com-e chairmen inform the Council in this respect 6th Session.

Administrative Correspondents have also regularly circularized requesting the submis- of information suitable for publication, for cation in the Council's quarterly Bulletin, and replies have been received.

Until recently, the Bibliographic Corres-nts had over a period of years failed to reply e repeated requests of the Secretariat that nation be supplied on fisheries publications ring in their territories. The policy has adopted, with some success, of sending at erly intervals a form for completion by each spondent.

There has been no action by the UNESCO spondents during the period and it is sted that the continuation of these nomina- be suspended.

nal Relations

Contact has been maintained during the l with several organizations pursuing objects r to those of the Council, as follows :

UNESCO. A proportional payment of $500 was received from UNESCO towards inting of the joint Plankton Symposium held nection with the 5th Session. Printing has completed and copies are available at this on.

35. Contact has been maintained at a regional level by the Secretariat with the UNESCO Science Co-operation Offices at New Delhi and Djakarta, and UNESCO was represented at the 20th Session of the Executive Committee at Kandy, Ceylon, at which the regional oceanographic programme was discussed.

36. The Committee is informed that, with the approval of the General Conference of UNESCO at its 8th Session, a meeting of experts was held at the headquarters of FAO at which draft terms of reference were drawn up for a proposed UNESCO International Advisory Committee on Marine Sciences for submission to the Executive Board of UNESCO in November, 1955.

37. In the meantime, the Committee is informed, an interim Advisory Committee will meet in Tokyo on October 24 and 25, 1955 by invitation of the Japanese Government. A regional meeting of representatives of Institutes in Marine Sciences will also meet on October 17 and 18, while a Symposium on Oceanography will take place from 19–22 October.

38. While neither the Council nor the Secretariat was advised as to the mutual convenience of these dates immediately following the 6th Session of the Council (which may involve some modification of the post-conference fisheries inspection tours organized by the Japanese Government for IPFC delegates on these same dates), it is understood to be the intention of UNESCO to invite IPFC observership at these three meetings, albeit that no official invitation has yet (September 1, 1955) been received.

39. The Executive Committee therefore suggests that the Council may wish to discuss which parts, if any, of the proposed programme of the Council might legitimately be passed on to the Advisory Committee thus lightening the workload of the Council, which would subsequently be in a position to draw on the scientific knowledge accumulated by the Advisory Committee for practical application in the fisheries programmes.

40. It is the understanding of the Executive Committee that the mutual value of the Advisory Committee and the Council, each to the other, will be that UNESCO will, through the Committee, foster much of the fundamental work which scientists engaged in fisheries development find themselves unable to carry out because it is not of immediate application to the fisheries ; that these scientists engaged in fisheries development will now be in a position to draw to the attention of UNESCO situations in which fundamental

knowledge is lacking ; and that with the existence of two such bodies engaged in the fundamental (UNESCO) and applied (FAO) fields respectively, it may be possible for each to devote itself more effectively to its own field of action.

41. *United Nations.* The Council was represented by Dr. N. K. Panikkar (India) and Mr. M. J. Lobell (U.S.) at the United Nations International Conference on the Conservation of the Living Resources of the Sea which was held in Rome from April 18 to May 10, 1955 and also by the Secretary, acting on behalf of the Chairman, at the preliminary meeting of experts held in New York in January, 1955 to assist the Secretary-General in the drafting of the Agenda.

42. It was the object of this meeting to give effect to the Resolution 900 (IX) of the General Assembly calling for appropriate technical and scientific recommendations to be referred to the International Law Commission in its current studies relating to territorial waters and the legal status of the continental shelf and its superjacent waters.

43. Substantial recommendations were made in relation to the objectives of Fisheries conservation, the types of scientific information required for a conservation programme, types of conservation measures, existing international agreements and the application of available measures to other international fishery conservation problems. Copies of the final report of the Conference are available for consultation at the 6th Session.

44. Contact has been maintained with the Economic Commission for Asia and the Far East in respect of its Water Development programme and its Inland Waterways Sub-Committee.

45. The Secretariat contributed a chapter on the effects of river development on the fisheries in the manual published by ECAFE, available for consultation at the Session.

46. The Inland Waterways Sub-Committee of ECAFE has proposed the international standardization of regulations regarding shore marks and buoys in inland waters, also available for consultation.

47. *F.A.O.* The existing relations between the Council and its parent body have remained unchanged during the year and close liaison has been maintained with the Fisheries Division in Rome.

48. The Annual Report which the Council must under its constitution submit to the Conference of FAO was prepared by the Executive Committee for the period 1954–55 and submitted by the Secretariat through the Director-General. Copies are distributed at this Session as Workin No. 12.

49. The FAO International Rice Com at its 4th Session, passed a resolution su joint action between the government depa concerned with rice production and fisherie view to elucidating the advantages and d tages of utilizing flooded rice fields for fish operations, and that this matter be studied Council.

Members of the Inland Fisheries Sub-Co have been requested to report to the Co cordingly and a special item has been incl the 6th Session Agenda which will no do up to fruitful discussions, effective resea authoritative information on the subject b controlled experimentation.

50. The Council was represented by th ary at the 3rd Session of the General F Council for the Mediterranean, held in Mo October, 1954. A copy of the Proceeding tributed at this Council Session. The acti the GFCM are summarized in Workin No. 11.

51. *Other Organizations.* The Secre presented FAO (but not the Council) at Annual Meeting of the International Whali mission which took place in Tokyo in Jul The 7th Meeting was held in Moscow 1955. One of the principal results of th meetings has been the gradual reductio capture of blue whale units from 16,000 t by 1957, the shortening of the season for ing of blue whales, and the bringing of he and other aircraft within the jurisdiction Commission. The Director of the FAO F Division has discussed with the Norwegian Industry the possibility of making avai other countries certain proteins from wha which are now wasted.

52. The Council was represented Secretary at the 8th Meeting of the E Council of the South Pacific Commis Noumea, New Caledonia, in July, 1955, a the details of a fishermen's training cou jointly organized by the Commission and 1956 were discussed.

53. The Secretary visited the operatio quarters of the Norwegian Foundation for developed Countries in Quilon, India, i 1955.

54. The 2nd Session of the Pan India Science Congress took place at Perth, A

gust, 1954. The Council was not invited to presented.

A 2nd International Seaweed Symposium organized at Trondheim, Norway, in July, by the Norwegian Institute of Seaweed arch. According to information received FAO, papers were based on the present posi- f seaweed research and seaweed exploitation, ling the chemical composition of seaweeds, ical uses, processing, ecology and botany.

cations

Sections I and II of the 5th Proceedings he Plankton Symposium Papers have been shed (the latter jointly with UNESCO). They been widely distributed and copies are avail- t the 6th Session.

The greater part of the typescript of the ter of Institutions is with the press and will r in 1956.

The Council's Current Affairs Bulletin has red regularly at quarterly intervals.

No manuscripts of Handbooks have been available to the Secretariat by the General r. The budget allocation for printing could erefore be fully spent.

The Council's publications are currently buted to some 500 institutions throughout the .

A sales policy, approved by the Organiza- as resulted in the Council's publications be- g available for purchase by interested indi- ls who were previously unable to acquire on an exchange basis, at reasonable prices.

Special Publication No. 3 'Economic Marine of Tropical South and East Asia and their ation', by J. S. Zaneveld is in the proof stage.

The revised List of Scientific and Other licals published in the Indo-Pacific Area was d and copies distributed by FAO.

The FAO Yearbook of Fishery Statistics -53, Vol. IV, Part I, has been published.

The book on the 'Fishing Boats of the ' containing useful contributions from the has also been published.

Occasional Papers. The following Occa- Papers have been issued :

1954. 'The Status of the Fisheries in River Basin Development'
'FAO Expanded Technical Assistance Programme in Fisheries'

1955. 'International Legislation sought on Sea's Resources'
'Sampling Methods used in Japanese Fisheries Catch Statistics'
'A short history of the fisheries laboratories in Indonesia'
'Selected bibliography on fisheries published in Japan during the Year 1954'
'Current Bibliography for India'
'Current Bibliography for Indonesia'

67. *Library Accession List.* A list of library accessions from 1st January 1954 to 30th June 1955 is furnished in Working Paper No. 13.

Bibliographies

68. Current country bibliographies have been supplied by correspondents for Japan, India, and Indonesia and are available as Occasional Papers 55/4, 55/5 and 55/6 respectively.

69. Little progress has been made on the Council's projected Sector Bibliographies since the circulation of that for the Western Sector at the 2nd Session.

70. A bibliography of Indian Fisheries which, in conjunction with Rao's 1938 bibliography, will in a great measure perform the function of the Bibliography of the Western Sector, was published by the National Institute of Sciences of India and is distributed at the 6th Session.

71. The question of the Council's future bibliographic programme is discussed in the Review of the Council's Work (Working Paper No. 2–A) and is recommended for study by the Council.

72. A bibliography on Tilapia by P. Chimits appeared in FAO Fisheries Bulletin for January to March, 1955.

Technical Assistance

73. The Organization has continued to provide technical assistance to those governments which have accorded a sufficiently high priority to their fisheries projects at the national planning level.

74. Mr. J. Alan Tubb (Australia), until recently Vice-chairman of the Council has assumed duty in Burma and will carry out a general survey of the inland waters with a view to advising on development.

75. Mr. Einar Kvaran (Iceland), Marine Engineer, and Mr. J. Saemundsson (Iceland), Fisheries Engineer, continued to work as a team advising the Government of Ceylon.

76. Dr. Shao-wen Ling, until recently engaged in freshwater fish culture technical assistance in Thailand, has transferred to Ceylon in a similar capacity.

77. Mr. P. Ziener (Norway), Naval Architect, continued to assist in the programmes of the maritime States of India for the improvement of fishing craft. Mr. G. Illaguson (Iceland) is carrying out experimental fishing on the Coromandel Coast in a seiner provided by the United States International Co-operation Administration. The following additional appointments are in progress: Mr. C. R. Bjuke and Mr. C. G. Bjuke (Sweden), Fish Harbour Specialists, a second Naval Architect, a Fishery Technologist, a Fishery Engineer, a Fish Marketing Specialist, an Inland Fishery Biologist and a Fish Fleet Manager.

78. Discussions are in progress for the services of a Food Technologist and a Marine Biologist to assist the Government of Thailand. Arrangements have been concluded for an experimental shipment of *Tilapia melanopleura* to Thailand from the Belgian Congo.

Technical Instruction

79. The Fish Marketing Training Centre recommended by the Council at the 5th Session was successfully held in Hong Kong in July/August, 1954. The Secretary assisted the Governor at the opening ceremony. 30 participants from 10 Member Governments attended.

80. Mr. P. Lusyne (Belgium) is at present in India assisting the Government in the organization of a training course for fishermen on a national basis in accordance with the Council's recommendations at the 5th Session.

81. A training course for Pacific Island fishermen was discussed by the Secretary at the meeting of the South Pacific Commission Research Council in Noumea, New Caledonia in July, 1955 and will probably take place in the latter part of 1956.

82. Arrangements have been concluded for the holding of a second Inland Fisheries Training Centre in Indonesia with a duration of six weeks as from October 31, 1955. There will be places for 20 participants named by Member Governments.

83. The Council will no doubt now wish to make further suggestions for future regional Training Centres. The Committee believes that there is an urgent need for the training of fisheries administrators.

84. A proposal that participants f region attend the Fisheries Admi Training Centre currently operating in Co Denmark, was unfortunately not successfu

Council's Agreement and Rules

85. As has been mentioned under (5 a proposal has been put forward under it the Agenda for the 6th Session to enable t man to co-opt the chairmen of technical tees to substitute for absent members Executive Committee. This will av danger that the Executive Committee in certain circumstances, be unable to m lack of a quorum.

86. It has been further suggested that t 'meeting' be substituted for the word ' throughout the Agreement, so as to con universal parliamentary practice and to formulated FAO standards; and that mea taken to amend the Agreement so that th majorities specified in the Rules of Proce not contradict the Agreement. These amen are dealt with in Working Paper No. 3.

87. Similarly, the words 'meeting 'session' should, with certain excepti transposed in the Council's Rules of Proce a proposal to this effect is contained in W Paper No. 4. The provision relating to majorities is added to Section IX.

Parliamentary Procedure

88. In accordance with the desire expre the Council at the 5th Session (p. 6 of Proc brief indications on parliamentary procedu drafted by the Secretariat and are given as ing Paper No. 5. A recommendation is m a motion to the effect that in cases which covered by the Council's Rules, those of t and Agriculture Organization shall apply o these are not applicable, the Council's par ary authority shall be Robert's Rules of O abbreviated by O. Garfield Jones in a l publication of Appleton–Century–Crofts In York.

Documents Issued

89. In addition to the documents and tions mentioned elsewhere in this Rep letters, 27 circulars and 50 cables were is the Secretariat during the year 1954.

REVIEW OF THE COUNCIL'S WORK

PART I—INTRODUCTION

ie present analysis arises from the Council's tive at its 5th Session recorded on page 6 of rinted Proceedings, that the Executive Com- e draw up a full and complete review of the of the Council, including the present status of esolutions and recommendations, and the ts, both direct and indirect, that have followed.

ie time for such a stock-taking of the Council's vements is particularly appropriate, falling as es in the year of the tenth anniversary of its it Organization, the F.A.O., which, at its third on held at Geneva in 1947, recommended action should be taken to initiate the forma- of regional councils for the scientific explora- of the sea in parts of the world not actively ced by similar bodies, giving primary con- ation to the following areas . . . South- ern Pacific and Indian Ocean . . . The Fourth on of the Conference of F.A.O. held in ington in 1948 stated that "these Councils d be concerned principally with the work of ulating problems, deciding priority of approach co-ordinating the efforts of Member Govern- s in the research programme formulated."

a meeting of the representatives of certain rnments in the area convened by the United dom Special Commissioner for South-east Asia 947, it was recommended that the F.A.O. ld take the initiative in the formation of such ternational council to be constituted by the rnments of countries having an interest in the ries of Asia and the Far East.

pursuance of the above recommendation, a al meeting was convened by the Director- ral of the Organization at Baguio in the ppines in February, 1948, at which an Agree- for the constitution of an Indo-Pacific eries Council was drawn up between the rnments of Burma, China, India, Netherlands, hilippines, United Kingdom and United States. Agreement became effective as from Novem- 1948 when the fifth acceptance was notified to Director-General, and a total of 17 Govern- s have now adhered to the Agreement, with withdrawal. Meetings have since been held ngapore, Australia, India, the Philippines, and and. The Sixth Session is scheduled to take in Tokyo, Japan, as from September 30,

While your Committee has, in part II of this Report, provided an analysis of that part of the Council's work which comes within the purview of the Committee, it is difficult to arrive at very precise conclusions as to the extent to which governments may have put into execution the Council's recommendations at the national level, nor is it easy to gauge to what extent the action taken by Member Governments in respect of fisheries development is the direct result of Council discussions, although where such development has occurred it has corresponded closely with the Council's suggestions.

It is, indeed, only the Member Governments themselves who are in a position to make a full appraisal of the immediate benefits which have accrued to them from Council membership, while the ultimate advantages can only be expressed in terms of better living standards, to which the Council is only one of many contributing factors and which could become only partly manifest in the short period represented by the life of the Council. This is especially true in the field of fisheries, where the operatives are among the most conservative branches of society.

Nevertheless, certain trends are evident. For instance, although fish culture has been practised in Asia at the cottage level since time immemorial, it has always been subject to a high mortality and the recent application of scientific principles to the collection, transportation and raising of fry in several countries has been encouraged by the Council with highly satisfactory results.

Rapid progress in mechanization of fishing from small indigenous craft as discussed by the Council is resulting in more economic operations in many areas of the region and in the field of fish marketing, which has received the Council's attention, a trend is evident towards the improvement of distribution systems and there is evidence of a gradual tendency towards the suppression of the traditional practice of artificially depressing the prices paid to the fishermen through arbitrary action by financiers.

The replies of Member Governments are appended to this report and are analysed in Part III. They show a consensus of opinion that the Council is reasonably performing the functions for which it was created.

In most cases, emphasis is placed on the value of the Council's role as a clearing house for information, on the advantages afforded by personal relations between senior fisheries officers and by inspection tours on the occasion of Council Sessions, and on the Council's intervention in the technical instruction programme of F.A.O. The view is expressed that at the recent Council Sessions there has emerged a successively more crystallised concept as to the functions of the Council and that, while the effect on the industry is necessarily of a long-term nature, the Council has developed an approach which is already exerting a healthy influence on fisheries policy, especially in the more under-developed countries of the region.

The Committee feels, however, that the potential value of the Council to its Member Governments might be much greater. Only three governments report that specific steps have been taken to implement the Council's recommendations in respect of their own fisheries activities.

Another important phase of the Council's programme from which governments have not as yet received full benefit is the organization of co-operative research. In particular, Sub-committees have been formed to design appropriate programmes of investigation in respect of the Rastrelliger (mackerel) and the Hilsa fish. The only meeting which it has been possible to convene was that of the Hilsa group in Calcutta in 1952. No co-operative programme was formulated meeting, but rather a recommendation constitution of a unit to carry out the although it was not clearly stated who shou the cost. It is hoped that, before the 6th S the group will again have met to map out able co-operative programme for the invest of the Hilsa stocks between the gover concerned.

A similar plan for co-operation in res Rastrelliger is proposed, but as no less tha Member Governments are involved, it has been possible to convene a representative m to define a programme of research, notwithst the generous offer of the governments United Kingdom and the Federation of to hold the meeting in Penang. It is possil Member Governments supporting such p co-operative measures will brief their de to the 6th Council Session as to their p participation in such a meeting, and an should be made at the 6th Session to draw concrete working plan.

The Executive Committee also believe after examining the present report and the o of Member Governments as to the v past and future work, the Council shoul again turn its attention to the solution difficulties which have been encountered in of the work by committees in the intervals b Council Sessions, which is reviewed in Part

PART II—WORK OF THE COUNCIL'S COMMITTEES

1. Technical Committee I (Hydrology and Biology).

The first Session in Singapore (March 1949) was largely taken up with matters of a procedural nature such as the Rules of Procedure and the terms of reference of the Council's two technical committees. Progress achieved on the different committee activities is recorded below.

It was agreed that Committee I should, during the ensuing period, explore the opportunities for collaboration and co-ordinated research by Member Governments of the Council and report thereon to the Council in the study of: (a) Tuna resources, (b) Clupeoids, Engraulids, Scombroids and Carangids, and (c) the development of fish culture in fresh and salt water. At the 2nd Meeting, it was reported that three special *ad hoc* Sub-committees had been formed to report on these aspects, plus four additional Sub-committees on (d) Plankton, (e) Hydrology, (f) Taxonomy and (g) Seaweeds. Other Sub-committees wer blished in subsequent years for (h) Hilsa, (i) and (j) General Biology. Progress in res these matters during the ensuing years has follows :

1.1. Sea Fisheries Panel (Chairman—Mr Dahlgren—U.S.)

1.11. Oceanic Fisheries—Tuna.

At the 2nd Session, the Tuna Sub-co proposed that its efforts should at first centrated on a sufficiently restricted field to early progress and stressed the importa determining whether the species of Pacif were segregated into racial populations, to end morphometric data should be stand and published.

In response to resolutions of the Council 3rd and 4th Sessions, additional informa tuna was forthcoming from the Governm

tralia, Japan, the Philippines and U. S. terri-s as a result of which an expanded report on Yellowfin Tuna is nearing completion. The aining governments of the Region reported no work had been done on the ecology of

t its 5th Session, the Council again recom-ded that continuing efforts be made by rnments to obtain morphometric data and mation on the ecology of tuna, to undertake ing operations and to initiate exploratory fishing una. No doubt the report of Technical Com-ee I to the 6th Session will indicate to what nt these programmes have been adopted in countries of the Region so that the Council decide as to the past, present and future fits of this programme, or recommend a ification of it, to Member Governments of the ncil.

he tuna resources of the Indian Ocean are even known than those of the Pacific and might itably be the subject of research by the govern-ts whose territories adjoin that ocean, in tion to the investigations at present being rtaken there by vessels of nations geogra-ally farther removed, on which it is hoped the Council will be fully informed at the 6th ion.

he following papers on Tuna have been pre-ed to the Council:

1. ' A Survey of the Pelagic Fisheries of the World : Part I—General Considerations ', by H. S. Rao, 1949.
2. ' A Survey of the Pelagic Fisheries of the World : Part II—The Biology of Pelagic Fishes ', by N. K. Panikkar, 1949.
3. ' Methods of Biological Research on Pelagic Fisheries Resources ', by O. E. Sette, 1949.
4. Some Recent Advances in the Study of the Biology and Racial Division of Pacific Tunas ', by M. B. Schaefer, 1951.
5. ' Pacific Oceanic Fishery Investigations—Statement of Programme ', by O. E. Sette, and M. B. Schaefer, 1951.
6. ' Preliminary Report on a comparison of the stocks of Yellowfin Tuna ', by W. F. Royce, 1953.
7. ' Distribution and Migration of Tunas in Japan ', by H. Nakamura, 1954.

1.12. Inshore Fisheries

he Sub-Committee on herrings, anchovies, kerels and horse mackerels organized by Com-ee I under point (b) above was designated as ' Neritic Pelagic Fisheries Sub-Committee '.

After a period of three years during which this Sub-Committee produced no report, it was directed, at the 3rd Session, to survey the programme of research bearing on pelagic neritic fish stocks and recommended that Member Governments furnish information on their programmes in connection with chub mackerels (Rastrelliger), Sardines (Sardinella) and other clupeids and anchovies.

During the period between the 3rd and 4th Sessions, it was reported, maturity scales were prepared by the Indian Central Marine Fisheries Research Station and measurements were taken of a number of specimens of Rastrelliger from India and Indonesia, but the results of these activities of the Sub-Committee are not yet available to the Council. It was recommended that a programme for research on these mackerels be undertaken through a central agency.

On the basis of the Sub-Committee's work, a questionnaire was drawn up at the 4th Session and distributed to governments in accordance with Resolution 24.3 (8), so that the methodology of investigation of these fisheries might receive attention at the 5th Session.

Although some of the replies to the questionnaire were of a negative character, they provided preliminary information on the nature of the stocks and the status of research, and the conclusion was reached that the central area extending from the Indian Ocean to Netherlands New Guinea was lacking in personnel, equipment and funds for these investigations. Interchange of information and personnel was recommended, as was also the adoption of the methods in use in Australia and Japan. Governments were moreover strongly advised to take steps for the development of the statistical services indispensable to such a programme paying special attention to the trends of production, especially those following on the introduction of mechanized fishing and the Sub-Committee was to formulate suitable sampling techniques and standardized procedures.

The Council, at its 5th Session, confirmed the need for continuing this work and suggested that particular emphasis might be placed on gauging the extent of the neritic pelagic fish stocks, efforts to be concentrated for the time being on Rastrelliger. To this end, consequent on the regrouping of the Council's work into panels, a Sub-Committee on Rastrelliger was formed by Panel ' B ' (Sea Fisheries) which, it was recommended, should meet to design an appropriate research programme.

Attempts were made during 1955 to convene a meeting of the Sub-Committee for this purpose, but it was not possible to obtain adequate partici-

pation. It has been suggested that a definite date be fixed at the Council's 6th Session for such a meeting, after consideration of the available information. It must be kept in mind that an adequate study of the Rastrelliger fishery must also involve contributions by the Craft and Gear Panel of Technical Committee II. Papers presented to the Council having a bearing on these fisheries are :

8. ' Development of Pelagic Fisheries ', by J. D. F. Hardenberg, 1949.
9. ' *Rastrelliger kanagurta* (Ruppell)—Its Fishery and Biology : Summary of our knowledge—Study Programmes ', J. Durand, 1949.
10. ' Studies on the Life-history, Bionomics and Fishery of the White Sardine, *Kowala coval* (Cuv.),' R. V. Nair, 1952.
11. ' A Contribution to the Biology of the Silver Belly, *Leiognathus splendens* (Cuv.),' H. L. Arora, 1952.
12. ' The Oil Sardine Fishery of India : I—A Review ', by Indian Delegate, 1953.
13. ' The Oil Sardine Fishery of India ', by R. V. Nair, 1953.
14. ' The Neritic-Pelagic Fisheries of Japan ', by Nakai, Z. *et al.*, 1954.

1.13. Sea Fisheries—General.

Other items placed on the programme of work of the Sea Fisheries Panel between the 5th and 6th Sessions are : Methods of age determination for tropical species, and reports on practical investigations on fishing with lights. The results of these studies are awaited, no information as to the activity of the Sea Fisheries Panel during the most recent period being available to the Secretariat at the time of writing.

The old distribution of work on the Sea Fisheries having fallen into two Snb-Committees, dealing with Tuna and Neritic-Pelagic fisheries, the other aspects such as trawling and line fishing for demersal and reef fishes have not been specially dealt with by the Council.

Papers presented :

15. ' The Over-fishing of the East Australian Trawl Fishery ', by W. S. Fairbridge, 1952.
16. ' Fisheries of Sind Coast ', by M. R. Qureshi, 1954.

1.2. Inland Fisheries Panel (Chairman—Mr. K. Kuronuma—Japan).

The Sub-Committee on Fish Culture at the 2nd Session stated that it would communicate a report when further information had been received from governments. At the same time, it recommended that precautions be taken by governm prevent the intentional or accidental imp of undesirable species and that such impo and transplantations be reported to the Co

At the 3rd Session, an analysis of the cultivated in Ceylon, East Pakistan, Mal Hawaii was presented, together with a tabl ing the area of cultivable inland waters region. It was recommended that M Governments initiate or intensify their progr of investigations, including the survey of cu waters, studies of fish food, breeding and compatible combinations and optimum den different species under cultivation and the deration of fish seed resources.

Reports were also requested from M Governments on their experience with he for the elimination of noxious plant growt on the pollution of natural waters.

At the 4th Session, it was reported there signs of a more scientific approach by Gover to the problems of fish culture, althoug solutions were often lacking. Reports we mitted on the introduction of exotic speci several countries and on the trade in fis between several territories. Weed contr received special attention in India and the pines, and considerable information had gathered on the factors causing the pollut natural waters and possible solutions.

In the meantime, the Council's Special P tion Nos. 1 and 2 on ' Fish Culture in Br Water Ponds in Java ', by W. H. Schuster a ' Fish Culture in Indonesia ', had appeare latter based on the curriculum of a first Culture Seminar organized in Indonesia c Council's recommendation in April/May, 195 a second Seminar on the same subject org by F.A.O. on an international basis, also Council's recommendations, had been he May/June, 1952.

At the 5th Session, it was recommende specific problems relating to the pollution of should receive attention of Member Governme also the conservation and exploitation pro arising from River Development Projects; r of work done on the basis of the Council's r mendations regarding stocking densities combinations of species; the food and feedi fishes ; and, as the specific task of a *Chanos* Committee constituted at the 4th and 5th Ses the biology and culture of the milkfish, incl exploration for fry and breeding investigation

A Sub-Committee on Hilsa fish (*Hilsa i* was formed at the 4th Session and represent

ia and Pakistan met in Calcutta in Septem-952, when the present knowledge regarding sh was summarized and the contributions een made available in printed from in the nal of the Asiatic Society' (Vol. 20, No. 1, -79, 1954). Certain recommendations were lated for co-operative research which, owing r costly nature, have not been implemented vernments. The Government of India has, nderstood, offered to receive research workers he other countries concerned, i.e. Burma, an, at an Indian centre. The further report Sub-Committee is awaited through Tech-Committee I, at the 6th Session.

question of fish culture in flooded rice fields ceived the Council's attention and was dis- by the International Rice Commission (IRC) tober, 1954. It was recommended that the be studied jointly by Agricultural and ies Research Stations in member countries nat a joint committee of the IRC and the be formed to deal with these problems. At quest of FAO, an item has been included in genda of the 6th Session to which the special on of Member Governments has been drawn.

of the more encouraging results of the close nal contacts established by the fisheries s of different countries at Council Sessions een the initiative taken by governments for xchange of suitable cultivable species, of the most spectacular has been the rapid gation of *Tilapia mossambica* which, after its liscovery as an aquarium escape in Indonesia, ken to Malaya and thence has been distributed y and via Thailand to many countries within tside the Region. The Council has, neverthe-ncouraged governments to introduce such species only after it has been shown by an ex-re study that such transplantations are not to prejudice the locally cultivable species. ticular, advice was given to the Government la along these lines at the 5th Session.

information has reached the Secretariat on ogress of the work of the Inland Fisheries during the period between the 5th and 6th ns.

following papers have been presented at l Sessions on Inland Fisheries and Fish e (including the pollution of natural waters, lsa):

'General Review of the Fish and fish Cul-ture in the Continental Waters of Indo-China and the Projected Programme of Work', by L. Lemasson, 1949.

18. 'Notes on Fish Fry Industry of China', by S. Y. Lin, 1949.
19. 'Physiological Aspects of Adaptation to Estuarine Conditions', by N. K. Panikkar, 1951.
20. 'Application of the Principles of Fish Culture to Estuarine Conditions in Singapore', by D. W. Le Mare, 1951.
21. 'Physiological Requirements of Eggs, Larvae and Fry during Transportation', by S. P. Basu, 1952.
22. 'An Investigation of the River Godavari and the Effect of the Paper Mills Pollution at Rajamundry', by S. V. Ganapathi, and P. I. Chacko, 1952.
23. 'Methods and Problems of Collecting Eggs and Fry for Transplantation', by H. R. Rabanal, 1952.
24. 'A Provisional Survey of the Introduction and Transplantation of Fish throughout the Indo-Pacific Region', by W. H. Schuster, 1952.
25. 'The Fitness of Ecological Niches into Which Fish are Introduced at Various Ages and the Survival of the Transplanted Fish', by Soong Min Kong, 1952.
26. 'Fish Culture in Pakistan', by N. Ahmad, 1952.
27. 'Fish Seed Industry in India,' by T. J. Job, 1952.
28. 'Notes on the Fishery of the Cyprinid Fish, *Thynnichthys vaillanti* in Indonesia', by H. Saanin, 1952.
29. 'Preliminary Report on Air Transport of Live Fish in Sealed Tins under Oxygen Pressure', by K. F. Vaas, 1952.
30. 'Sur la Pisciculture au Cambodge', by R. Lafont and Dom-Saveun, 1952.
31. 'Biology of Hilsa', by S. L. Hora, 1953.
32. 'Hilsa Investigations', by N. K. Panikkar, 1953.
33. 'A Preliminary Biometric Study of Certain Populations of Hilsa, *Hilsa ilisha* (Ham.)', by T.V.R. Pillay, 1953.
34. Studies on the Rate of Growth of Milkfish of 'Bangos' *Chanos chanos* (Forskal) under Cultivation', by H. R. Rabanal, R. S. Esguerra and M. M. Nepomuceno, 1953.
35. 'International Fish Seed Exchange', by T. J. Job, 1953.
36. 'Chinese Systems of Pond Stocking', by S. Y. Lin, 1954.
37. 'Feed of Bangos Fingerlings', by P. G. Padlan, and H. R. Montalban, 1954.
38. 'pH in Pond Fertilization', by D. V. Villadolid *et al.*, 1954.

39. 'Do Chinese Carps Spawn in Japanese Waters?', by K. Kuronuma, 1954.
40. 'Paddy field Prawn Fishery of Travancore-Cochin', by M. K. Menon, 1954.
41. 'Water Hyacinth and its Control in Fish Ponds', by N. Ahmad, 1954.
42. 'Migration et Reproduction des Poissons d'Eau Douce du Cambodge', by Sao-Leang and Dom-Saveun, 1954.
43. 'Occurrence of Chanos Fry in Thailand', by J. Thiemmedh, 1954.
44. 'Pisciculture au Viet Nam', by Cao Thien Buu, 1954.
45. 'Densité Optimum de Peuplement et Associations des Espéces Compatibles', by Nguyen Nhu Nghi, 1954.
46. 'On Occurrence of Chanos Fry in Indonesian Waters', by H. Saanin, 1954.
47. 'Investigations on the Racial Characteristics and Biology of the Hilsa of the Hooghly River', by T. V. R. Pillay, 1954.

1·3 Miscellaneous Fisheries Panel (Chairman—Dr. Tham Ah Kow—U. K. [Malaya]).

The Miscellaneous Fisheries Panel was consituted at the 5th Session in an effort to consolidate the many sub-committees which had grown up in previous years, in order that, in view of the scarcity of suitably qualified experts in these different fields, the Council's work be concentrated on only one or two aspects at each Session, thus allowing of more thorough treatment. The work of this group is, therefore, rather complex, combining that of the old Sub-Committees on Hydrology, Plankton, Minor Fisheries (sponges, coral, invertebrates) the taxonomy of these groups and taxonomic problems of a general nature not covered by the other panels.

1·31 Oceanography and Limnology

At the 2nd Session, the Council instructed the Secretariat to locate sources of supply of oceanographic equipment (which was obtained and circulated) and recommended that surface temperature and salinity observations be carried out from commercial vessels plying to member countries as well as from small vessels operating in inshore waters, and that the Secretariat should be responsible for their reception, reduction and publication in atlas form as is done by the International Council for the Exploration of the Sea.

As a result of the latter recommendation, it was reported at the 3rd Session that surface salinity observations had been received by the committee only from Indonesia in respect of the Java and Banda Seas. It was recommended [in Re 20·1 (1)] that Member Governments in continue the collection of salinity and tem observations for regular transmission Secretariat and compilation of the data in a the form to be determined by the Cor Governments were also [in Resolution 2(recommended to develop hydro-biological gations in estuarine and neritic waters.

Salinity maps compiled by Mr. P. Ch. V Indonesian waters were published and ci at the 5th Session and some surface tem observations were taken in the engine r commercial vessels plying out of British Borneo in 1952 and 1953. These were pa to the Sub-Committee. The total num observations is, as yet, quite insufficient to to compile an atlas. Moreover, any actio these lines, to be useful, should consti advance on the atlases already published Royal Netherlands Meteorological Institut Executive Committee now feels that, ev sufficient volume of temperature and salin were to be forthcoming, the task of prepa atlas could only be undertaken if additio were supplied to the Secretariat for this purpose.

The prospect of establishing a Regiona nographic Unit was brought up at the C 4th Session and was discussed at a me oceanographers called by UNESCO and in Manila immediately prior to the 8th Science Congress in 1953. Although the e ment of an Institute has been dropped, U has under study the possibility of appoi oceanographer for the Indo-Pacific Regi similar aims in view, to work in close colla with the Council. It is hoped that this will have progressed sufficiently to allow o information being made available at Session.*

The Miscellaneous Fisheries Panel wa Council's 5th Session, requested to study in the collection of oceanographic data per fisheries programmes and their applic population surveys, development and/o vation and the further report of Panel Committee I on these matters is awaite 6th Session.

The following is a list of papers on Ma Estuarine Hydrology presented at Sessions:

48. 'Oceanography in the Indonesia pelago', by M. W. R. Krauss,

* UNESCO has also recently constituted a 9-member Advisory Committee on Marine Science on world basi

'Summary to Date of the Hydrological Work of the Fisheries, C.S.I.R.O.', by D. J. Rochford, 1951.

'Hydrology of the Estuarine Environment', by D. J. Rochford, 1951.

'Preliminary Observations upon the Release of Phosphate from Estuarine mud', by W. Stephenson, 1951.

'A Comparison of the Hydrological Conditions off the Eastern and Western Coasts of Australia', by D. J. Rochford, 1952.

'Estuarine Problems in South-east Asia', by J. D. F. Hardenberg, 1951.

'A Study of Drift in Malacca and Singapore Straits for Salinity Determinations', by R. A. Robinson, H. Tong and Tham Ah Kow, 1953.

e doubt has been expressed by some Mem-vernments as to whether the collection of and temperature data in the manner con-ted, perhaps with un-uniform methods, will ute in the foreseeable future to the food

32. Plankton

principal concern of the Council at its 2nd was the standardization of collecting ds, and several technical contributions in this ave, at different times, been presented to and ed by the Council. No report was forth-from the Sub-Committee at the 3rd Session, h were recommended (*a*) systematic surveys kton, (*b*) studies of seasonal distribution examination of the relationships between on intensity and occurrence with hydrolo-ctors, and the interrelationships between on organisms and important fishes and n the different plankton organisms them-Resolution 20·2 was adopted recommend-t Member Governments furnish information r plankton investigation in marine, brackish sh waters for compilation and recommen-by the Sub-Committee while Resolution requested the Government of India to pre-revised bibliography on plankton for the n Sector, which appeared as Occasional 51/3.

iderable progress was evident at the 4th in the work of the Sub-Committee during iod, although few plankton workers were As a result of information received from ntries of the Region, it was evident that n investigations varied in intensity and eness owing to lack of personnel and equip-It was recommended that plankton lists be compiled, even though these be restricted for the time being to the shorter lists of 'indicator species'. For these purposes, a list of specialists available for consultation on the different classes was made available (p. 69 of Proceedings), and recommendations as to standard procedures were drawn up.

In order to promote greater interest in these programmes, Plankton was chosen as the subject for a symposium at the 5th Session. Through the co-sponsorship of UNESCO, planktonologists from within and outside the region were present and a large number of technical contributions became available. More definite recommendations as to standardization were made. No specific task was allocated for the ensuing period in respect of Plankton.

The following technical contributions on Plankton have been studied by the Council:

55. 'The Organization and Utilization of Plankton Investigations', by H. Thomson, 1949.
56. 'The Plankton Calendar of Singapore Straits with Suggestions for a Simplified Methodology', by Tham Ah Kow, 1953.
57. 'Phytoplankton Studies in Eastern Australia', by E. J. F. Wood, 1951.
58. 'On the Methodology of Marine Plankton Collection, with a Suggested Classification', by Z. Nakai, 1954.
59. 'On the Nutritional Relationship between Plankton and Fish in Indonesian Freshwater ponds', by K. F. Vaas, 1954.
60. 'Some Factors Controlling Algal Production in Salt Water Lagoons', by V. K. Pillai, 1954.
61. 'Hydrology and Seasonal Fluctuations of the Plankton in the Hooghly Estuary', by N. Dutta, J. C. Malhotra and B. B. Bose, 1954.
62. 'Studies on the Blue-green Algae in Japan,' by T. Harada, 1954.
63. 'Observations on the Distribution and Fluctuations of Planktonic Larvae of Mandapam', by R. R. Prasad, 1954.
64. 'A Preliminary Study of the Plankton of the Chilka Lake for the Years 1950 and 1951', by M. P. Devasundaram and J. C. Roy, 1954.
65. 'The Role of Planktonology in Fisheries Development', by Tham Ah Kow, 1954.
66. 'A Preliminary Study of the Hydrology and Fauna of the Vellar Estuary (South Arcot Dt., S. India)', by K. Ramamurthi, 1954.
67. 'Variations in Zooplankton Abundance in the Central Equatorial Pacific, 1950–1952,' by J. E. King, 1954.

68. 'Feeding Habits of the Pond-smelt, *Hypomesus olidus* and the Plankton Succession in Lake Suwa' by Y. Shiraishi, 1954.
69. 'On the Plankton Research in Japan with an Annotated Bibliography', by S. Motoda, 1954.
70. 'On the Plankton of Three Fresh-water Fish Ponds in Madras City, India', by P. I. Chacko and B. Krishnamurthy, 1954.
71. 'On Carp Fry Mortality in Nursery Ponds and the Role of Plankton in Their Survival and Growth', by K. H. Alikunhi, H. Chaudhuri and V. Ramachandran, 1954.
72. 'Preliminary Observations on the Biology of Boreo-Arctic and Subtropical Oceanic Zooplankton Populations', by C. J. Fish, 1954.
73. 'Notes on the Utilization of Zooplankton for Food in Thailand', by S. W. Ling and M. C. Kosol Suriyong, 1954.
74. 'Tropical Fresh-water Plankton', by Professor A. Thienemann, 1954.

1·33. Crustacea

The field of the old General Biology Sub-Committee was defined at the 4th Session as relating to Mollusca and Crustacea and to minor fisheries such as sponges, beche-de-mer, turtles and commercial corals, and that for the 5th Session technical papers be invited on the Prawn and Shrimp Fisheries. Much interest was shown in the contributions presented and the subject of Prawn and Shrimp Fisheries was allocated as the subject of further study by the Miscellaneous Fisheries Panel during the ensuing period and for a symposium at the 6th Session, which should include trawling in deep and shallow waters, life history and all aspects of utilization and processing with suitable economic evaluation of each and, if possible, models of gear and samples of the products.

The following papers have been read on Mollusca and Crustacea:

75. 'The Life-history and Bionomics of an Indian Penaeid Prawn *Metapenaeus dobsoni*, Miers', by M. K. Menon, 1952.
76. 'Studies on the Growth of *Katelysia opima* (Gmelin)', by K. V. Rao, 1942.
77. 'Les Espèces du Genre *Scylla* à Nha Trang (Viet Nam)', by R. Serene, 1952.
78. 'The Grapsoid Crabs of the Malayan Mangrove Swamps', by M. W. F. Tweedie, 1954.
79. 'Prawn Fishery of East Pakistan', by N. Ahmad, 1954.
80. 'The Shrimp Industry of Singap Tham Ah Kow, 1954.

1·34. Seaweeds

The Council requested, at its 2nd Sess Member Governments undertake further mic research on the algae of the Regic work of the Sub-Committee having bee capped by the loss of its Rapporteur, Mr. Moon Ki, it nevertheless produced bibliography and an account of studies gress in Australia, Indonesia, the Pl and Japan, including a list of 43 wo different groups of seaweeds. At the 3rd the Sub-Committee was asked 'to con activities', that information be supplied critical factors in the manufacture of acid and agar, and recommended ta studies on the economic genera *Gracill Hypnea*.

At the 4th Session it was pointed out information came under the heading secrets and that the only information avail that contained in scientific publications, those from Australia being supplied. It possible to make any report on *Gracill Hypnea*. It was agreed that Dr. J. S. should revise his papers on Economic Algae of Malaysia with additional inform be supplied by Member Governments, and been done.

The Council, believing that the develop the seaweed industry was restrained for reliable methods for measurement seaweed crop, proceeded to obtain inf on this matter from seven Member Gov and from the Seaweed Research Institute land. The Sub-Committee was thus able sent substantial documentation at the 5th and to recommend that Member Govern the Council carry out studies based methods used by the Scottish Institute, they are applicable to tropical conditions.

No specific task other than that mention 1·33 was laid down for the Miscellaneous Panel for presentation at the 6th Session, reports of Member Governments on the r the work undertaken as a result of the recommendations are awaited.

The Council has given consideration following papers on Seaweeds and their u (note that these papers also concern t Technology Panel of Committee II).

81. 'The Economic Marine Algae of and their Applications: I.—Cy and Chlorophyta,' by J. S. Z 1949.

. ' The Economic Marine Algae of Malaysia and their Applications : II.—The Phaeophyta,' by J. S. Zaneveld, 1949.

·35. Taxonomy

e desirability that the names of economically tant fishes be standardized was considered echnical Committee I between the 1st and essions and the Council expressed the belief, latter Session, that priority should be given Clupeoids and Scombroids.

e Chairman of Technical Committee I during eriod carried on considerable correspondence he International Commission on Zoological nclature, which believed that the indispens- rst step was to draw up lists of the economi- mportant fishes the names of which should oilized. The Council suggested that opinions be invited from Member Governments as to ossibility of their naming institutions and duals to draw up such lists.

its 3rd Session, the Council recommended Member Governments make available to the nomy Sub-Committee identification keys of common fishes, with vernacular names, and ne Sub-Committee should utilize these in the ation of general field keys for the Council.

pecial report to the 4th Session by the Sub- nittee further examined the proposal to sub- the International Commission suggestions ndardized names, and drew attention to the lties arising from the lack of workers in the having time and facilities for taxonomic s.

Fisheries Division of FAO had in the ime drawn up a check list of the Scombroids, was now believed that a similar list was ly required for the Clupeoids. (Note : As a of the Council's recommendations, Mr. R. pan Nair of India has published ' A Key to ommon Clupeoid Fishes of India', *J. Zool. India, June, 1953.* A Check list of Indo- Fishes, by W. H. Schuster and R. R. iredja was published by the Indonesian nment in 1952. Many other check lists are ble.)

Executive Committee was asked to take for the preparation of a special handbook on most important groups of fishes. Dr. J. Hardenberg, at that time working in Indo- agreed to be the author of such a handbook as drafted three chapters relating to the groups. Dr. Hardenberg has since left his ment in Indonesia.

At the 5th Session, the Council only briefly examined the question of taxonomy and reiterated the need for simple field keys. It was decided that each of the Panels of Technical Committee I would in future deal with the taxonomy of the groups with which it was concerned and that problems relating to taxonomy as a discipline would be referred to the Miscellaneous Fisheries Panel.

2. **Technical Committee II** (Technology)

2.1 Craft and Gear Panel (Chairman—Mr. M. J. Lobell—U.S.A.)

The programme of Committee II as regards Craft and Gear was, at the First Session (1949) stated to be ' increasing the efficiency of methods of fish capture by the adoption of up-to-date methods, including mechanization, modifying these wherever possible to conform with existing conditions ', and ' the survey of fishing grounds for both demersal and pelagic fishing outside territorial waters '. As a result, the Committee was requested to investigate the extent to which surveys had been made and to report to the 2nd Session in respect of the following :

(*a*) local boats and gear,
(*b*) non-indigenous gear,
(*c*) net efficiency and preservation.

At the 5th Session (1954), the above objectives were, for the next few years, expanded as follows :

1. Introduction and appraisal of mechanized fishing methods for small, indigenous craft.
2. Introduction and appraisal of non-indigenous gear.
3. Design of small fishing boats for the region.
4. Appraisal under fishing conditions of net and rope preservation methods.
5. Exploration for new shrimp resources.
6. Use and effect of fishing with lights.
7. Use of indigenous materials for nets and gear.

2.11 Catalogue of local fishing methods

The Committee reported, at the 2nd Session, that ' one of its activities had been the survey of local boats and gear ', but no report was presented. The Council recommended that Member Governments should provide information on fishing methods and gear and that a suitably qualified person be selected to collate the data so obtained, which should then be published.

It was not, however, until the 3rd Session in 1951 that a group of three workers of the Philippines (Mr. A. F. Umali), the United Kingdom (Mr. T. W. Burdon) and Viet-Nam (Mr. Tran Van Tri) undertook to prepare this catalogue, and

it was recommended at the 4th Session that this work be continued, but that plans for a handbook on Gear Technology should be postponed.

The question of the taxonomic classification of fishing methods has received the attention of the Council and several alternative keys have been prepared. The Council resolved (at the 5th Session) that the work to-date should now be passed to the editor of the projected handbook on Gear Technology.

A 'classification of fishing boats' was at the 3rd Session delegated to a worker from the United Kingdom and this was presented at the 4th Session. Plans for a catalogue of fishing boats were dropped, brief descriptions of particular types of boats were to be included in the classification of gear.

2.12 Non-indigenous Gear

A questionnaire was prepared at the 2nd Session and circulated to governments, seeking information on the types of non-indigenous fishing gear which had been introduced. Member Governments were, moreover, requested to summarize for the 3rd Session, the results of research work on new materials for fishing gear. At the 3rd Session a formal resolution recommended that 'Member Governments who have carried out such projects should furnish the Secretariat at the earliest opportunity with full information.'

At the 3rd Session (1951) information had been received from three governments and one or two additional references have since been received. Two workers of the Philippines (Messrs. Manacop and Rasalan) undertook to coliate this and the study is still awaited. Since it is known that a very large number of introductions of non-indigenous gear has recently been made in the territories of Member Governments of which the Council has no official record, the Committee believes that the above mentioned monograph, to be useful, should not be restricted to the limited information collected from only three Member Governments in 1951, and should emphasize the evaluation of the results.

2.13 Harbour Facilities

The Council at its 3rd Session adopted a resolution drawing attention to the problems created by the lack of proper harbour facilities for fishing craft and recommending action in connection with this problem.

2.14 Gear Preservation

At the 2nd Session, a questionnaire was developed on methods in use for the preservation of gear. At the 3rd Session it was report replies had been received from five territo that two workers in the Philippines had un to collate this. At the 4th Session, repli stated to have been received from North Australia, India, Indonesia and Singap bibliography of gear preservation was pres Technical Paper No. 33.

At the 5th Session, further replies h received from Australia, Cambodia, the maritime States of India, East and West and these were consolidated on pp. 98-10 Proceedings. It was recommended that Governments should now undertake exp in order to arrive at conclusions as to the rative effectiveness, under fishing condit the methods described and their possible i ment.

Technical Papers dealt with by the Coun proceedings on Gear Technology :

83. 'Marine Fisheries of Pakistan Review on Trawling', by Qureshi, 1952.
84. 'Indigenous Marine Fishing Thailand', by S. Charernphol,
85. 'Report on Non-indigenous Fish —Results of the 1st Series of ments in the Operation of "Ma (a common Japanese Trap Thai Waters,' by S. Charernp T. Bamrajarinpai, 1950.
86. 'Indigenous Marine Fishing Thailand—Supplementary N S. Charernphol, 1951.
* 'La Pêches au Filet sur le Gran Cambodge' by B. Charpy, 195
'Procédés de Pêche, au *then* de miens', by Nguyen Luong R. Serene and M. Morechand,
'Frame Trawl Fishery of La Bay', by P. Manacop and Capco, 1951.
'A Fish Corral Used in P Waters', by S. B. Rasalan, 19
87. 'An Attempt at Classification o Methods', by C. J. Bottemanr
88. 'A Consideration of the Classifi Fishing Gear and Methods', b Burdon, 1951.
89. 'The Experimental Introduction Fishing Vessels within In Ceylon', by K. Chidambaram
90. 'A Proposed System for Catalog Boats Used in the Fishing Ind

* Un-numbered papers were *not* published in the Proceedings.

South and East Asia ', by C. A. Gibson-Hill, 1952.

1. ' Fishing with Day Net in the Tonle-Sap (Cambodia) ', by Sao-Leang and Dom-Saveun, 1952.
2. ' A Contribution to the Knowledge of Fishing Gear in Viet Nam ', by Tran Van Tri and R. Serene, 1952.
3. ' The Efficacy of Some Net Preservatives on Cotton Twines ', by J. I. Sulit and P. Panganiban, 1954.
4. ' The Classification of Fishing Gear and Methods in Japan ', by S. Takayama, 1954.
5. ' Fishing Craft of East Pakistan ', by N. Ahmad, 1954.
6. ' Fishing Craft and Tackle of Saurashtra ', by K. R. Srivatsa, 1954.
7. ' Trawl Fishing in Indian Seas from 1948 to 1953 ', by K. Chidambaram, 1954.

Food Technology Panel (Chairman—Dr. kery—Australia)

report was submitted by the Fisheries ology Committee at the 1st Council Session suggesting (*a*) a survey of processing and ng industries keeping in mind possible nization and prevention of wastage, (*b*) l establishment of experimental and demons- stations, and (*c*) gradual adoption of sanitary res. As a result, the Council requested Tech. ittee II to investigate the extent to which s had been made of processing industries seek reports on canning, packaging, refri- n and by-products.

n considering local processing methods, it nsidered that some of these because they e ' most unattractive products and involve erable wastage ', command a low price and small outlet. It was agreed to place this n the Agenda for the 2nd Session.

t the 2nd Session (1950) two original and one contributed publication were ted from what was then French Indo- , but the agenda item was only taken up Council at the 3rd Session (1951), at two further papers were received from dia, three from the Philippines and one on d utilization from India. As a result, cal Committee II agreed that ' through inary formulation by members of sugges- the Committee at the next Session could rrive at an agreement. . .' The Council owever, recommend that Monsieur Lafont e) be invited to prepare a ' classification e ' which was presented at the 4th Session, based on published material received from Member Governments, and that each Government designate a food technologist to collaborate in drafting suggestions for a hand-book.

Consideration of these matters at the 4th Session was limited to the observation that the Council's work in this subject relates chiefly to the project for preparing handbooks, and for technical instruction '. One paper was, however, presented by the Philippines on fermented fish products and one on seaweed utilization, and the Committee was asked to give attention to the seaweed industries. The Sub-Committee was to be the Council's liaison with the F.A.O. Committee on Fish Handling.

At the 5th Session, the Council expressed its disappointment that little progress had been made and that there were few food technologists present. It was believed that two publications on food technology should be prepared rather than one; the first, a handbook, dealing with the Principles of Fish Handling and Processing and the second, a special publication on the ' Best Methods of Fish Handling and Processing Suitable for the Region ' and that the latter could be issued as a series of pamphlets on individual aspects.

The Panel would study, during the period between the 5th and 6th Sessions, improved methods of producing and storing dried fish and, in particular, methods suitable for use in humid or rainy weather.

Technical Papers presented on Food Technology:

98. ' The Problems of Fish Storage and Refrigeration in South East Asia ', by W. B. Braxton, 1949.
' Experimental Canning of Fish at Estancia, Philippines ', by C. Martin, 1949.
' Preliminary Report on Studies of Salted Fish Paste ', by J. I. Sulit and S. B. Santiago, 1949.
' Vitamin A and Oil Content of some Philippine Fish Livers ', by C. Butler, 1949.
99. ' An Experiment in Fish-salting ', by J. Westenberg, 1950.
100. Fishery Products of Indo-China—a Compilation of Literature up to the Japanese Invasion ', by J. Westenberg, 1950.
' Forme d'Utilization des Produits de la Pêche au Cambodge ', by R. Lafont, 1950.
' Studies on the Salt Concentration of Dried and Smoked Fish ', by V. Uyenco, P. Rodriguez and R. Taruc, 1951.

'Utilization of some Philippine Fisheries Products', by A. M. de Vera, 1951.

'Chemical Composition of Philippine Market Fishes', by J. I. Sulit *et al*, 1951.

101. 'Mechanics of *Bagoong* (Fish Paste) and *Patis* (Fish Sauce) Processing,' by U. Uyengco, I. Lawas, P. R. Briones and R. S. Taruc, 1952.

'Fish Processing Methods', by R. Lafont, 1952.

102. 'Situation de l'Industrie du Poisson Sec au Cambodge', by Dom-Saveun, 1954.

103. 'On the Food Value of Fish Sauces', by R. Lafont, 1954.

104. 'Fish Landings and the Refrigeration Industry in Japan', by S. Watari 1954.

Seaweeds.

105. 'Utilization of Seaweeds in India' by F. Thivy, 1951.

106. 'Utilization of some Philippine Seaweeds', by J. I. Sulit, O. B. Navarro, and R. C. San Juan, 1952.

2.3 Socio-economics and Statistics Panel (Chairman—Mr. D. W. Le Mare—U.K.)

2.31. Statistics.

Attention of Member Governments was drawn, at the 2nd Session, to the importance to their fishery departments of the availability of authentic, accurate information of the factors of production and distribution, and on the volume and composition of the catch as landed and in its marketable form and this was substantially repeated at the 3rd Session as Resolution 21.3(2).

It was recommended that a Fisheries Statistics Training Centre should be organized, that a statistical handbook for fisheries workers be prepared 'forthwith', and that Statistics should form a separate item on the Agenda of future Council Sessions.

A statistics working group consisting of Monsieur Royer (France), Mr. Burdon (U.K.), Mr. Sukhatme (India) and Dr. Kesteven (F.A.O.) met on several occasions and formulated valuable suggestions (pp. 39–40, 3rd Proceedings, pp. 77-79, 4th Proceedings).

In particular, the attention of Member Governments was drawn to the lack of fisheries statistics in many countries in the region and to the fact that, even where figures were available, no tion was given as to the methods em hence, not only was it not possible to standard methods of statistical collection, as a result, the accuracy and comparabilit data were open to question. The obst progress was the lack of trained person Governments were recommended to se eventual objective the establishment of a statistical service in order that they sh placed in possession of current informatio condition of the industry.

The terms of reference of this workin were : *

(1) The study and development application of statistical met fisheries work and the use of s methods in particular.

(2) The planning of a school in stat

(3) Assistance in the preparatio statistical handbook.

(4) Preparation of a recommenda Member Governments as t minimum immediate requirem statistics and the methods might be employed in meetin requirements.

The working group fulfilled each c requirements and circulated to Governmen to the 4th Session (1) a 'Draft Statement Statistical Programme', on which suggesti improvement were invited, and (2) a questi in the form of a check list requesting a description of the organization of statistical for fisheries in each country.

A new Sub-Committee on Statistics w stituted at the 4th Session (Rapporteur— Katamsi—Indonesia), to which the replies questionnaire received from Australia, Neth New Guinea and India were forwarde further report was received from this Su mittee, and the question of Statistics was cussed by Technical Committee II at t Session.

Following the Council's recommenda Fisheries Statistics Training Centre was co by F.A.O. in Bangkok in the latter part o Concern has been expressed that the Cou since its 4th Session given less attentio heretofore to Statistics. In view of the vita ficance of the development and applica

* Resolution 20.3(2) of the 3rd Session also recommended that this group prepare a series of instr pamphlets for biologists on statistical methods, and undertake the guidance of intensive pilot studies in India, P Thailand, Viet Nam and the Philippines.

s statistics to the proper understanding and ment of the industry, the Council may wish constitute the special Sub-Committee of to collate the information passed to the old mmittee and to advise the Council further gard to its statistical programme.

nical Papers submitted to the Council istical Methods:

'Pilot Statistical Study of a Fishing Community in Thailand', by W. Chindaprasert, 1951.

'A Survey of the Sea Fisheries of India', by D. V. Bal and S. K. Banerji, 1951.

'Fish Population Studies along the Malabar Coast', by B. S. Bhimachar and G. Venkatraman, 1951.

'Sample Survey for the Estimation of Total Catch of Fish on the Malabar Coast', by P. V. Sukhatme and K. Chidambaram, 1951.

'Sampling Methods used in Japan Fisheries Catch Statistics', by T. Yamamoto, 1954.

'On the Inshore Fish Population of the Straits of Singapore', by D. W. LeMare and Tham Ah Kow, 1951.

merous statistical publications have also ade available to the Council.

Socio-economics

the 3rd Session, Committee II was requestsurvey the programmes in progress in the n connection with the socio-economic condithe fishing industry and to consider whether endations may be made for the co-ordina- improvement of these programmes'. In on 21.3(1), technical papers were invited subject and attention was recommended to lem of indebtedness in the industry.

the 4th Session, a Symposium on Socioics was held. Technical Committee II that it had not been able to carry out any this field but drew attention to several papers presented which might form a or the vigorous development of the work eld'. No further progress was reported at Session and it was decided that 'the work at the 4th Meeting..... be the continuing ent of Panel C during the ensuing period.'

presented to the Council on Socio-econo-

'An Outline of a Preliminary Survey into the Socio-economics of the Fishing Industry of Hong Kong', by J. Cater, 1949.

110. 'A Programme of Socio-economic Research for the Fisheries of South East Asia', by G. L. Kesteven, 1949.
'Outlook for Industrialization of the Philippine Fisheries', by C. Martin and H. E. Warfel, 1950.
'Sur l'Interêt des Co-operatives d'Achat et de Vente des Produits de Pêche', by Dom-Saveun, 1951.
'Indebtedness among Fishermen', by K. N. Anantaraman, 1951.
'Socio-economics', by N. Ahmad, 1952.
'Socio-economic Problems of the Fishing Industry in Uttar Pradesh (India)', by D. S. Sonbaht, 1952.
'A Summary of the Movement of Fishery Organization in Indonesia', by C. M. Charidjie Kasuma, 1952.
'Socio-economic Uplift of the Roak Fishermen in Allahabad District, Uttar Pradesh (India)', by B. S. Kaushiva, 1952.
'Investigations of Indebtedness in a Fishing Village in Madras State', by K. N. Anantaraman, 1952.

111. 'Note sur les Relations entre Employés et Patrons-pecheurs a Nha Trang (Viet Nam)', by Tran Van Tri and Nguyen Chan, 1952.

112. 'Campaign against Indebtedness among Fishermen of Bombay State', by S. B. Setna, 1952.

113. 'The Socio-economic Programme with Special reference to Conditions in the Indo-Pacific Region', by G. L. Kesteven, 1952.

114. 'Some Important Socio-economic Problems of the Fishery Iudustries of Japan', by N. Oka, I. Konuma, K. Yamamoto and M. Abe, 1954.

2.33 Marketing and Distribution

The Council, at its 3rd Session, assigned the study of the fisheries trade to a working group of France (Monsieur Lafont), India (Mr. Ranganathan) and the U. K. (to be named); this assignment was repeated at the 4th Session. No report has been received to date from this working group.

Fish Marketing and Financing was specified as the subject for a Symposium at the 5th Session and several informative papers on marketing organizations were presented, on which only brief discussion was possible owing to the priority given to another Symposium held in connection with the same Meeting. However, the Council at this Session 'recognized that priority in the Socio-economic field should be given to the improvement of marketing' and that the initial effort should be

towards group formation (including co-operatives, with credit from Government, the latter withdrawing gradually as the industry is able to take over.

It was agreed that there had not been sufficient time for adequate discussion of the Symposium Papers, and papers were invited from Member Governments for presentation at the 6th Session on (a) advances in fish marketing and (b) development of consumer tastes.

A successful training centre was conducted in Hong Kong in July/August, 1954 with participation by workers from nearly all Member Governments.

Papers presented on Marketing and Distribution :

(98) ' The Problems of Fish Storage and Refrigeration in South East Asia ', by W. B. Braxton, 1949.

115. ' Fish Marketing in Batavia ', by G. L. Kesteven, 1949.
' Fish Marketing ', by E. J. F. Wood, 1950.

116. ' Problems of Fish Marketing in the State of Orissa ', by G. N. Mitra, 1954.

117. ' A Note on Marketing and Preservation of Fish in Saurashtra ', by K. R. Srivatsa, 1954.

118. ' Fish Marketing and Financing in Australia ', by Commonwealth Fisheries Office, Sydney, Australia, 1954

119. ' The Hong Kong Fish Marketing Scheme ', by Department of Agriculture, Fisheries and Forestry, Hong Kong, 1954.

120. ' A Preliminary Report on Lanmadow Fresh Fish Market', by U Ba Kyaw, 1954.

121. ' Etude sur la Commercialisation des Produits de la Peche Maritime', by Tran Van Tri, 1954.

3. Fisheries Development Working Group (Chairman—Mr. M. J. Lobell—U. S. A.)

This Inter-Committee Working Group was constituted at the 5th Session and its report is awaited.

4. General Business

4.1. Survey of Institutions

This very early project of the Council (1st Session Res. 7(5), 2nd Session Res. 16, 4th Session Res. 14) has been completed and the Register is in the hands of the printers. It was agreed at the 2nd Session that the Register should be annually.

4.2. Register of Projects

This was to be prepared follo completion of the Register of Institutio Committee however believes that the Co wish to clarify its ideas as to the funct register, the type of questionnaire to be and the likely response from Membe ments.

4.3. Bibliographies

4.31 Sector Bibliographies

It was agreed, after study by a sp Committee at the 2nd Session, that gene graphies for each of the sectors (Western Other) were to be compiled by the Secr the alphabetical order of the authors' n indexed subject-wise, the indexes to be by specialists. It was also suggested specialists should prepare a review of important papers.

A ' Bibliography of Fisheries of tern Sector ' containing some 2,300 was prepared by the Secretariat and cir mimeographed form as Working Paper the 2nd Session with the object that Committees might assist by proposing p whom the subsequent steps of the work undertaken.

The Executive Committee has c occasions expressed its desire to comply Council's wishes that the Bibliography Western Sector be completed as planned those for the remaining Sectors be co and has requested that the Council dete whom this work shall be allocated in vie increasing obligations placed on the pres tariat staff.

Much supplementary material ha available—e. g. the bibliography for Indi period 1938—1950 accompanying Sub-S (Fish and Fisheries, by Dr. N. K. Panikka work ' Progress of Science in India- VII—Zoology ' published by the Nati titute of Sciences of India. New Delh follows on H. S. Rao's bibliography in ' of Zoology in India during the past tv years ' and in various subject bibliograph tioned below.

The work entailed in compiling an the Western Sector bibliography and c those for the remaining Sectors, whil present stage largely mechanical, would re

e-time services of a competent clerical assistant rarian.

4.32 Current Bibliographies

It was the intention of the Council, as essed in several Resolutions, that the Sector ographies should be kept up to date (i.e. after) by Current Bibliographies, the responsibility which would lie with Member Governments igh a panel of experts functioning in each ry channeling its information to the Secre- through a country Bibliographic Correspon-

The Secretariat has no information regar- the formation or functioning of such panels xperts. Bibliographic Correspondents have, ver, been named by all Member Governments have furnished some information to the Secretariat. This, supplemented by such references as may have come to the Secretariat's attention, has been printed in the Council's quarterly Current Affairs Bulletin and Occasional Papers.

4.33 Subject Bibliographies

There has at different times been considerable discussion regarding the status of subject bibliographies. At the 2nd Session, it was stated (Res. 15) that 'the Council will indicate from time to time the subjects in which work may be started in all sectors...', and that apart from the selected bibliographies appended to the Council's handbooks and other publications, these should be printed as library cards.

At the 3rd Session, the preparation of the following subject bibliographies was approved. The status of each is given :

Subjects	*Assigned to*	*Status*
) Plankton of the Western Sector (revised).	India.	Prepared by N. K. Panikkar. Issued on 1951 as Occasional Paper No, 51/3.
) *Chanos chanos*	Indonesia.	An annotated bibliography was prepared by W. H. Schuster. Issued as Occasional Paper No. 52/3 (1952). For an addendum prepared by the Sub-Committee see pp. 71-72 of 5th Proceedings.
) Tuna Fisheries	U. S. A.	It was indicated that the existing bibliography by B. M. Simada published as Fish and Wildlife Service Bulletin No. 55 should be used.
) Hydrology	Australia.	.....
) Fishing Gear	...	Prepared by T. W. Burdon (U. K.) Circulated in 1952 as Occasional Paper No. 52/2.
) Fisheries Products and Processing ...	India.	Prepared by K. Chidambaram.
) Marketing of Fisheries Products' ...	...	...
) Weed Control [4th Session Res. No. 24·3 (12)].	U. S. A.	Supplied at the 5th Session. Printed on p. 93 of Proceedings.
) Fishing Boats	...	By C. A. Gibson-Hill. Technical Paper No. 34 at 4th Session.
) Fishing Gear Preservatives	...	Anon. Issued as Technical Paper No. 33 at 4th Session.
) Fish Culture in India	...	By T. V. R. Pillay, published in Journal of the Zoological Society of India, Vol. 3, No. 1, pp. 141–158, (1951).
) Hilsa	...	By S. Jones, published in the Journal of the Zoological Society of India, Vol. 4 No. 1, pp. 89-99 (1952).

At the 4th Session, however, a report was ed in the sense that, in future, subject biblio- ies should only be published if they are ated and accompanied if possible by a review e, since, it was argued, if they were mere f references, they would duplicate the subject es to the sector and current bibliographies. result, for the time being, having been a ion of the bibliographic activities, the il might now wish to reconsider this .

Handbooks

At its 3rd Session, the Council proposed to a series of handbooks [Res. 16 (1)].

The Secretariat was asked to undertake the General Editorship (Dr. G. L. Kesteven personally undertook this function, at the request of the Executive Committee, on transfer to F.A.O. Headquarters, Rome, in 1952).

Each Member Government was requested to nominate one person to act on the General Editorial Committee on Handbooks (no nominations received). This Committee was to prepare the prospectuses and a panel of authors was to be established.

At the 4th Session, it was resolved that 'technical editors for the handbooks be found as soon as possible, that large-scale collection of data and detailed consideration of prospectuses be postponed until such editors are available' and

that the Secretariat should proceed with the preparation of a ' Handbook of Field Procedures '.

Special attention was given both at the 4th and 5th Sessions to the prospectuses on the volumes on Food Technology. In addition to the Handbook, a separate Special Publication would deal with processing and handling methods.

A synopsis of the Handbook on Field Methods was approved at the 5th Session and the preparation of the series of handbooks was placed in the hands of Dr. Kesteven for implementation over a period of several years.

The further report of the General Editor of Handbooks is now awaited.

4·5 Technical Assistance and Technical Instruction

4·51 *Technical Assistance*

The Council has at the last three Sessions studied at some length the F.A.O. programmes for Technical Assistance and Regional Training Centres and has made valuable suggestions of which cognizance has been taken by the Organization.

Queries have from time to time been raised at Council Sessions as to the apportionment of F.A.O. Technical Assistance experts to certain countries and not to others. As was explained in Occasional Paper No. 54/2 (1954), such assignments are only made at the direct request of Member Governments. While it is true that certain countries standing in urgent need of expert assistance from outside have not been able to obtain it, it has now been made clear in this and other documents that such requests for technical assistance in the field of fisheries has been given low priority by government co-ordinating agencies.

Also, it is axiomatic that high-level technical assistance is not likely to be profitable in countries which still lack an adequate staff of trained fisheries workers to assist the expert, absorb his instruction, implement his programmes and be fully capable of continuing the work at a comparable level on the completion of the expert's assignment.

4·52 *Technical Instruction*

The Chairman and Secretary were requested in Resolution 18 of the 3rd Session (*a*) to keep Member Governments informed as to training courses available and (*b*) to assist host governments in developing details of training courses undertaken in their territories.

This policy has been maintained in the case of training centres which have been organized by F.A.O. on the recommendations of the Council in Inland and Brackish-water Fish Culture (2 centres), Fisheries Statistics and Fish Marketing.

4·6 Co-operation

The Council has been represented Meetings of numerous international bod reciprocally, has had the opportunity of wel observers from these organizations at its Se Several resolutions refer to these aspects.

4·7 Films

Resolution 17 at the 3rd Session rec Member Governments to provide the Sec with a list of fisheries films. Some infor was received in 1952 and was made available 4th Session, together with a list of motion p in the film library of the U. S. Fish and W Service. A comprehensive list of films fr sources was prepared by F.A.O. Fisheries D and produced as Working Paper No. 20 at t Session. Further information on available has appeared in the Council's Quarterly B Administrative Correspondents have now been asked to supply supplementary lists o on fisheries produced since 1951.

4.8 Miscellaneous Recommendations to M Governments

The council has made numerous recor dations to its Member Governments in the of its five Sessions. Those which are con with technical matters have been dealt with under the respective headings. Those which a general nature are listed below :

2nd Session: ' Member Governme keep the Secretariat informed eac (in January) of all technical fisher grammes being undertaken togethe copies of statistical and other r sent to F.A.O. Headquarters '. T formation has not, in practice, requested by the Secretariat at the mencement of each year, but just p the Council Sessions for incorpora the report on the status of fisherie grammes and of the industry. response has been fair. The r could be more valuable if more mation were given on actual de ments in the fishery industries an sequent improvements in nutrition.

3rd Session: ' Member Governmer channel current fisheries informat the Secretariat, through adminis correspondents '. The Secretaria developed a system whereby Admi tive Correspondents are reminded obligation some time prior to the rance of each *Current Affairs Bu* While information has been received

regularly from some correspondents, others have not replied.

'Member Governments to initiate or develop the training of adequate fisheries personnel'. While there is little positive information as to the implementation of this resolution by Member Governments, it is evident that certain countries have adopted a definite programme for training at home and abroad, while others standing in urgent need of trained fisheries personnel have either neglected to do so or have not been able, for various reasons, to take full advantage of the services of such personnel on the completion of training.

Positive recommendations on fisheries development (which are contingent on the formation of such administrative, research and development personnel) were adopted by the Council and appear on pp. 24-36 of the 3rd Session Proceedings.

Reference has been omitted to numerous Resolutions of the Council relating to purely procedural matters.

In addition to the above, many Resolutions relating to the organization of the Council's work, including the difficult problem of obtaining more effective and continuing contributions by the technical committees and sub-committees in the periods intervening between Sessions and the nature of technical papers contributed, are considered to be of such manifest importance to the future of the Council as to warrant special treatment in the final section of this Report (Part IV).

PART III—STATEMENTS OF MEMBER GOVERNMENTS

ccordance with the second requirement of uncil, Member Governments were requested, tter dated March 23, 1954, to make concise ents assessing the influence of the Council's on the fisheries of each country, including ication as to the most beneficial development Council's future activities. A reminder was o Administrative Correspondents on April 55.

lies have been received from eight Member nments, as follows:

Cambodia
Ceylon
India
Korea
Netherlands (for New Guinea)
Pakistan
Philippines
United Kingdom (for Malaya, Singapore & Hong Kong)

text of these reports are attached as Appendix eplies have not (August, 1955) been received the remaining eight Member Governments e Council. (Replies were subsequently d from Australia, France, Indonesia, Japan, nd, U.S.A. and Vietnam.)

re is a general consensus (i.e. four or more nments in each case) that the Council has had g influence in the constitution of government s policies in the region and that its recomions have generally played a significant role

promoting the establishment of increasingly effective fisheries departments charged with promoting more efficient exploitation of the resources,

(*b*) improved efficiency of government fisheries personnel through attendance at training centres,

(*c*) dissemination of information within the region,

(*d*) valuable personal contact between senior fisheries officers at Council Sessions and on-the-spot study of fishing methods and gear, processing, marketing and the problems of the host country. This has led to clearer thinking and close personal co-operation both during and after the Sessions which would not otherwise have been possible,

(*e*) devising and co-ordinating policies.

Individual Member Governments stated that they have derived particular benefit from the Council's programmes in fish distribution and marketing, processing methods, and fish culture, especially in respect of the growing facilities for the exchange of cultivable species both intra-regional and inter-regional.

It was further suggested that Member Governments might make statements regarding the future development of the Council's activities, and in this connection only two suggestions have been put forward by several governments in common. One is that the Council's work should have a more effective bearing on the development of the fishing industry with emphasis on projects which might be expected to give quick results.

One Government believed that the factors most likely to achieve this aim are : technical assistance ; technical instruction ; handbooks and other information on fish handling, processing and storing, and on the most suitable small craft, including mechanization. Another expressed the belief that long range research on the availability of fish stocks and the productivity of the sea should not be the concern of the Council.

In this connection, one particularly valuable criticism, while expressing satisfaction at the progress made in respect of fish culture and food processing, records the belief that the Council should increase its efforts in the socio-economic field with a view to obtaining the effective improvement of the low status of fishermen in some countries in the Region, for which concrete recommendations are still lacking ; to improve primitive and unsanitary marketing conditions ; and to continue the Council's valuable earlier work on statistical programmes which, it was felt, had lapsed. It was moreover felt th should be a wider exchange of information or methods and finally it was recommended full-time group of internationally recognized ties in each field should be created to di improve the fishery industries in each of the countries .... '

The other suggestion which received wide (three governments) was for the encou of joint action by neighbouring countries i of programmes which are of concern to m one government (tuna, hilsa, rastrelliger, shrimps, oceanography etc.), one expressio requirement being for the 'stimulation ordination of selected investigations by t according to regional needs '.

One government expressed the desire t expansion of the Secretariat staff to includ lists to advise on such subjects as fish cul fish marketing.

PART IV—ORGANIZATION OF COUNCIL WORK

The Council's Objectives

The tasks of the Council as laid down in its Constitution are : to identify the problems of development and proper utilization of the living aquatic resources ; to encourage and co-ordinate the application of improved methods ; to encourage and co-ordinate research ; to recommend and where appropriate undertake co-operative projects ; to recommend measures for standardization ; to assist Member Governments to locate equipment ; and to report on problems recommended to it for study.

The Council's Agencies

The organs of the Council for the performance of these tasks are :

(*a*) The Council in Session
(*b*) The Chairman and the Executive Committee
(*c*) The Secretariat
(*d*) The Technical Committees

Items (a), (b) & (c) merely form the administrative machinery which collectively identifies the problems, agrees on the priority in which they should be attacked, specifies the manner in which knowledge may be most readily acquired, receives and co-ordinates the results, thereupon making specific recommendations to governments regarding the solution of the problems, and establishes new targets.

It will be seen that a process is thus established, of which the raw material is information and that the resulting product is contingent on the quantity and quality of the stuff which is fed to the machine.

This raw material, the result of enquiry search, can only be made available thro continuing work of large numbers of in in the territories throughout the region simultaneously on the common problems.

Member Governments of the Council ha to assign workers in their national institu collect the results of current investigation specified problems and make them availab Council through established channels.

These channels are the Council's T Committees (d) upon the proper functi which the value of the Council's work will

Committee Work

Notwithstanding the analyses of the work made at the 4th Session (Proc. pp. 49 the 5th Session (Proc. pp. 42-45) it has agai apparent during the period between the 6th Sessions that the Technical Committ worked at varying levels of efficiency observations to which there is little that is be added, are recommended for re-reading the Council may now, on the basis of the inf provided in the preceding Sections of thi itself make a critical review of the stat pending resolutions and give its attentio unanswered doubts and queries in regar functioning of the Council's working gr

end some additional remarks are appended

Council has, at several of its Sessions, ex- l the wish to avoid the proliferation of Sub- ittees. This has resulted in an attempt to hrough six panels only, in the hope that the ttee work would in this way become effective.

he same time, experience over the past year that, where one of these panels is expected with many aspects, some or all of them are o be neglected. This is especially true of the laneous Fisheries Panel of Committee I, cio-economics and Statistics Panel of Com- II, and to a smaller extent the Sea Fisheries land Fisheries Panels which have, respectively, uted Sub-Committees for Rastrelliger, Chanos lsa.

appears to confirm the wisdom of the l's original plan whereby the six panels function only at the Council Sessions as a ient way of despatching business on several s each represented at the Session by a very number of specialists, whereas the actual ing work would continue to be done by ommittees.

in all parliamentary bodies whether they y meet or not, effective work depends almost vely on good organization and it is strongly nended that the Council's best interests can e served if workers proposed as Chairmen or rteurs only accept such nomination if they e and willing to undertake the rather exacting f group leadership.

onal enquiries by the Secretary as to the of some committee members to perform the llotted to them has often elicited the reply orkers 'are fully engaged on their own pro- es'. While the heavy workload devolving derstaffed fisheries institutions throughout r East is fully appreciated, it is submitted is statement reflects a misconception of the l's function.

ouncil's Worksheet

ng as the Council is considered by individual s as an extraneous body demanding work is unrelated to country programmes and is re a nuisance, the Council will to that extent its objectives. It is therefore submitted lelegates of Member Governments should st a vote in favour of new items on the il's worksheet when it is clear that at least Member Governments are in a position to ute effectively to that item through the assign- f work to individuals authorized to devote a substantial part of their time to it in the course of their official duties.

If the item is one in which a majority of the fisheries departments of governments represented at the Session subsequently express a lack of interest, this would constitute grounds for the belief that the Council should have declined to adopt the item into its worksheet in the first place or have postponed its consideration for a subsequent Session.

This does not mean that the adoption of any item must be contingent on the ability of every Member Government without exception to embark on the necessary programme of investigation, since it is known that in some countries fisheries administration is still in its infancy; it does mean that delegates have a right and responsibility to express critical opinion as to the general practicability of a measure, or to qualify a supporting vote with the statement that while the government is interested, it is presently unable to engage in the work.

In these circumstances it may be assumed that when a line of action is adopted by the Council, a majority of Member Governments are already interested in the results and will therefore integrate it into their own programmes, if they have not already done so. It should also be safe to assume that the results of the work so assigned will be made available to the Council through the established channels at least three months prior to the next Council Session.

In this connection, attention is invited to the view accepted at the 1st Session, that the basic structure of the Council's biological and hydrological programme must be related to national projects of research and development for which the Council would propose measures of co-ordination and integration aimed at ensuring that, wherever possible, the projects are complementary to one another and yield a maximum amount of information of common value from the existing resources of personnel and equipment.

Committee Reports

A note should perhaps be interpolated here as to the nature of the information which the members of Sub-Committee should submit to their Chairmen. They should report concisely on the local aspects of the particular problems assigned to the Committee; the measures which have been adopted to solve those problems; the degree of success or, in the case of failure the reasons therefor; and suggestions for the continuation of the work.

The lengthy exposition of information which is extraneous to the specific task allotted should be avoided but important items may be mentioned

briefly at the end as suggestions for future committee activities.

A distinction must here be made between (A) the reports of the Technical Committees on the progress made during the year on the Committee assignments and (B) those of the Technical Committees *at the Session.* The objects of these two types of reports are quite different and should not be confused.

Type (A) reports will constitute a rather complete review of the work performed in the region, the new knowledge available and the results achieved on each subject assigned for the attention of either of the two Technical Committees. They may be maintained at manageable size by reference to technical papers prepared by specialists for presentation at the Session in accordance with the criterion suggested elsewhere in his report. Such reference should mention the conclusions arrived at insofar as they are cogent to the programme and, while brief, should avoid sending the reader to the papers themselves. Confusing references to papers by the numbers assigned to them at the Session should be avoided. As mentioned elsewhere, Type (A) reports may also make reference to conclusions reached in published works which throw light on the subject dealt with.

The practice of the Technical Committee limiting itself to making a brief, non-committal statement and appending the Sub-Committee reports, to which other appendices and sub-appendices may be attached, is also confusing and should be avoided.

Type (A) reports will be accepted by the Council but *not* adopted.

Type (B) committee reports fall into a different category. Their principal and perhaps sole object is that they should form an integral part of the final report of the Council Session with as little rearrangement as possible by the Secretariat. They will, therefore, be based on the information made available to the Council at the Session through the type (A) reports, related Technical Papers and such new information as may come to light during the Session. Against this background, the Committee will prepare, at the Meeting, a report which will be limited to a brief reference to the information made available to it, an equally brief appraisal of the results achieved, its consequent recommendations to Member Governments as to the precise action required and, finally, recommendations to the Council itself as to further action along the same lines or the inclusion of new items of work for the subsequent period.

Type (B) reports prepared at the Council Session should therefore consist of a series of numbered paragraphs each containing some cogent i nected with the Council's work program them, the Committee may recommend to th specific Resolutions, although such actio essential because the adoption by the C a type (B) report converts the Committee' mendation into an act of the Council. The of specially worded Resolutions by the C has, however, the advantage that these may vidually re-affirmed by the vote of the C each Resolution.

Type (B) reports are therefore for ado the Council subject to amendments, which made by the Council itself at a plenary m by reference back to the Committee.

The first drafts of sections of type (B) C reports will presumably be prepared in place by the competent Panels and app a full Committee Meeting. It is sugges where such drafts obviously concern othe they be referred to such other panels for and return before being submitted to the f mittee Meeting.

Committees and panels should, when p these reports, avoid the danger of becomi tracked into generalities and should ende confine themselves to the Council's ass except insofar as they may have important tions of their own to make to the Council a business.

The report of the Executive Committe Session is for acceptance rather than adopt any suggestions made therein for action shou fore be specifically confirmed by the Council

Technical Papers

In order that the Council may, in the sh at its disposal at Sessions, concentrate problems in hand, it is suggested that th of technical papers submitted to the Counc be to elucidate the problems which have be fied as the objects of research during the although they may deal with matters wh been raised at any previous Session of the which have not been disposed of and a continuing nature.

Conversely, it should be accepted that th of the Council in inviting technical paper at this stage, the publication of a journal cellaneous fisheries subjects. Attention is the Council's views on the subject of contributions recorded on page 50 of the 4th *ings* and particularly to the belief t preponderance of purely descriptive papers lack of more advanced analytical papers c

the identification of the problems are not cive to the achievement of the Council's s.

uming the adoption of this criterion, a technical will endeavour to give as complete an tion of the existing knowledge on the particular dealt with as may be conveniently possible, ing reference to information contained in hed works, on the assumption that the Council either access to these works, nor the time to them in Session. A reference bibliography l also be appended.

ce the technical papers submitted will thus deal exclusively with matters specifically assigned Committees, they will, in fact, be an extension l form a background to the Committee reports. should be compiled with the full knowledge s necessary, in consultation with the competent ng group, and they will often reflect the results uncil research in more detailed fashion than ssible in the Committees' concise reports.

effort should therefore be made not only to the Chairman of the respective Technical nittee and Sub-Committee informed as to ject of the paper but also to complete the for transmission to the Chairman and if le the members of the competent working at least four months before the Council n so that reference to the substantial results e made in the main Committee report.

s distribution will be facilitated if the paper pared in the form of a stencil, which practice en common in the past but has been recently ted. The stencil and one copy should at the time be sent to the Secretariat. This will ave the effect of relieving the small Secretariat f the task of cutting several hundred pages of ls, for which it is insufficiently equipped.

hnical papers may be submitted in either of vo official languages of the Council, English nch and a separate abstract in English should epared.

preparation of the stencil presupposes that per will have been previously edited. While fully appreciated that only a minority of the ries in the region have English or French as ternal working language, it is believed that es exist in most countries for proper screening.

ention is called to the 'Note to Authors' on the back cover of Sections II and III of oceedings of the 2nd Session, which should nered to.

Recommendations

1. That the functions of the Council's Technical Committees, Panels and Sub-Committees be again examined. The duties of members of Technical Committees I and II between Sessions as defined at the 2nd Session should be clarified.

2. That action on Council decisions at Sub-Committee level should be the responsibility of Member Governments rather than of individuals. Delegates should be encouraged to communicate the extent to which accepted items will be integrated into national programmes.

3. That Member Governments of which the fisheries agencies are still inadequately staffed for the carrying out of fisheries research and development work, be once again encouraged to provide for the training and engagement of competent personnel.

4. That the work of each Sub-Committee be concentrated on one aspect during each period, which should then be the subject of extensive research by as many of the most competent government agencies as may be necessary. The aspect should be formulated as a problem to which Member Governments seek a solution and not as a general subject. Specific headings in the form of a questionnaire should be prepared at the Session as a general guide.

5. That the number of items assigned to Committees (and therefore the number of Sub-Committees) be restricted to those commonly accepted by delegates as being of vital importance to fisheries development. Items as to the immediate interest of which there is not substantial agreement should be deferred.

6. That the task of the Sub-Committee members assigned by governments to this work as a part of their official duties should be not only their own intensive work on the problem including the analysis of published material, but also information on that performed by other government laboratories and agencies.

7. That the individual reports of the Sub-Committee members be compiled into one co-ordinated document by the Sub-Committee Chairman in a form suitable for inclusion in the body of the report of the respective Technical Committee on the work performed between Sessions.

8. That technical papers should be principally directed towards the elucidation of the items under study by the Sub-Committees. Merely descriptive papers are still necessary where information is lacking but there should be increasing emphasis on the formulation and analysis of existing problems,

methods of investigation and reviews of the status of knowledge on a particular subject.

9. That at the 6th Session the unfinished portions of the existing assignments set out earlier in this report be re-examined in the light of the above criteria.

10. It has been suggested by some Member Governments that as the increasing administrative load on the Secretariat permits only a minimum of intervention in and guidance of the work of the Technical Committees, experts should be attached to the Bangkok staff for this purpose. Consideration should now be given to the financial implications of the employment of such experts and of the incidental clerical assistance which would not only be necessary in these circumstances but the lack of which has now been felt for some time.

11. The work performed in accordance with the Council's recommendations can only be properly and intelligently co-ordinated if all the r including technical papers, is submitted advance of the Council Session. Again du current period, with few exceptions little a has been paid to the deadline establis the Council with this end in view. Only individual workers assigned by Member ments perform their tasks promptly and c tiously, can the Council have before it an array of information as the basis for the discharge of its constitutional functions.

Failing this, the Council, while no doubt pe a relatively useful role, will only discharge a of the international task of which it is cap envisaged in the Baguio Agreement.

12. Finally, notwithstanding the una length of this report, it is to be hoped that the will find it possible to arrive at cons conclusions with a minimum of detrimen technical discussions.

APPENDIX I—SUMMARY OF RESOLUTIONS

Page	*Nature of Resolution*	*Status*
ID FISHERIES		
20	Collection by Committee I of information on fish culture.	General directive, no deadline.
12-13	Committee I to survey cultural practices and programmes and propose measures for improvement.	ibid.
13	Recommends government programmes for fish culture.	No report but many governments proceeding along these lines.
16	Control of exotic introductions. Report to Secretariat on all new introductions.	Few reports received.
13	Committee I to receive and analyze information on control of noxious weeds and prepare a handbook.	Reported that work was proceeding in India and the Philippines (p. 71, 4th Proceedings) but no real control measures available. No handbook.
17	U.S. to furnish bibliography on weed control.	Furnished (p. 96, 5th Proc.).
13	Governments to furnish information on pollution of waters. Committee I to codify information.	
17-18	Ibid.	Much information received, analyzed (pp. 61-66, 5th Proc.).
17	Governments to explore and report on actual extent of damage.	Awaited.
18	Governments to report on investigations of fish food organism.	No reports from governments. Paper on feeding of fishes invited for 6th Session.
18	Governments to report on densities and combinations of fish species.	Information at varying levels from seven countries analyzed (pp. 66-67, 5th Proc.).
9	Optimum combinations of compatible species to be a continuing assignment.	
18	Questionnaire on fish fry exchange.	Many replies received. Analysis by Secretariat passed to Committee I. Secretariat awaits indents from interested governments.
18	Acreage of cultivable waters.	Completed (p. 40, 3rd Proc., p. 68, 4th Proc.).
8/17	Calls attention of governments to fishery problems arising from water impoundment.	Action by governments not known. Secretariat contributed chapter to publication of Flood Control Bureau of ECAFE.
9	Introduction of Tilapia.	Recommendation made.
18	Co-operative Hilsa programme recommended. Small regional unit recommended. Technical Assistance to be considered.	The Hilsa Committee met in 1952 and accumulated much information and again in 1955. Committee I will report.
16	Governments to exchange information on Chanos.	No report as to exchange of information. Information supplied to FAO (p. 82, 4th Proc.).
11	Biology and pond culture of Chanos to be studied by Committee. Governments to state if technical assistance desired.	Report and technical papers awaited from Sub-Committee. No information on technical assistance.
SHERIES		
19	Committee I to assess Tuna Research.	Continuing assignment. Committee agreed to concentrate on requests for morphometric data.
13	Governments to supply morphometric data on Tuna.	Data used by Dr. Royce (U.S.) in technical papers.
16	Certain governments to supply morphometric data.	Data supplied.
16	Governments to supply information on ecology of Tuna.	Data supplied.
11	Tuna morphology, ecology and exploration to be a continuing assignment.	
19-20	Committee I to assess research on certain other marine groups.	No information.

Session	Page	Nature of Resolution	Status
SEA FISHERIES—(Contd.)			
3	13-14	Governments to report on programmes on sardines and mackerel.	Considerable information receiv reported on by Committee (pp 5th Proc.)
4	17	Questionnaire of sardine and mackerel issued. Recommends governments request technical assistance.	,, ,,
5	12-74	Efforts to be concentrated on Rastrelliger mackerel. Rastrelliger Sub-Committee formed. Detailed recommendations made regarding programme (p. 74).	Committee Report awaited.
MISCELLANEOUS FISHERIES			
2	16-17	Hydrology data to be sought by governments from commercial and on-shore vessels. Secretariat, if possible, to collate.	Limited information received fr or two vessels. Not sufficient t and Secretariat not equipped Information passed to Sub-Co Tabulation and charting left in by Sub-Committee (pp. 53 & 5 Proc.).
		Secretariat to locate sources of supply of instruments.	Sources located.
3	11	Repeats above (2/16-17)	
3	11	Paper on Japanese *Hydrographic* work to be circulated.	Circulated.
3	11	Governments to study estuarine *hydrology*.	
4	15-16	Collection of *hydrology* data should be accelerated in Central Zone.	'It was found difficult to obtain documented account of hyd programmes ....' (p. 15, 4th
		Indonesian Government to be asked to allow Mr. Veen to survey existing oceanographic stations, contact shipping lines and collate data in monthly charts.	Mr. Veen has now retired from In
4	8	Council's interest in *oceanography* Symposium of 8th Pacific Science Congress in Manila.	Attended by Executive Commit others.
4	14-15	Study of *Oceanographic* Institute. Governments urged to strengthen *oceanography* programme to the point where useful in production of food.	Institute project in abeyance. Little information.
		Reduction of data, documentation and consultative service, co-ordination and standardization on an international basis.	Pending.
		FAO to be consulted on availability of technical assistance funds.	No Technical Assistance funds imm available.
		Committee I to examine and report at 5th Session on need for *Oceanographic* collaboration by (i) direct contact between institutions (ii) an international institution, (iii) appointment of oceanographic personnel attached to the Secretariat.	Report to 5th Session did not sp examine these points. UNE considering appointment of an grapher in the region.
		Liaison to be maintained with UNESCO.	Maintained.
5	13	Governments urged to publish *hydrology* data and apprise Council.	One list published (Indonesia). tariat Note: It is believed th data, if suficiently abundant to b could [because of its bulk] profitably published after re
3	12	Governments to furnish full information on *plankton* investigations. Sub-Committee to compile and make suggestions.	A rather full report presented on limited information received (p & 67-70, 4th Proc.), including notes on the purpose of investigations with emphasis on species.
4	15-16	Dr. Vaas (freshwater) and Mr. Esguerra (marine) to continue correspondence on *plankton* and report at 5th Session on standardization and suitable programmes.	Correspondence continued, res ported (pp. 20-23 & 83-92, 5th supplemented by 5th Session sium. Voluminous and reiter commendations on standard and means for consultation available for government workers to follow. Council sho follow the *results*.

Page	Nature of Resolution	Status
ANEOUS FISHERIES (Contd.)		
13	*Plankton* Symposium at 5th Session.	Held.
14	Information sought on manufacture of *Seaweed* products.	Workers referred to standard publications (see Committee II).
	Taxonomic studies of *Gracillaria* and *Hypnea*.	No studies in progress.
		Information was given on Japanese workers (pp. 32-33, 3rd Proc.).
16	Mr. Zaneveld (Netherlands) to prepare monograph on *seaweed*.	Completed, with printers.
16-17	Governments to report on methods of *seaweed* survey.	Information gathered from two countries, others state no investigations.
	FAO to direct similar enquiries outside the region.	The basic information on survey methods is thus available to governments, and economic outcome should now be interest of Council, including processing angle (Committee II).
16	One minor fishery to be taken each year. *Prawns and Shrimps* chosen for current period.	Two papers at 5th Session.
13	Work to continue on Prawn and Shrimps and Symposium to be held at 6th Session.	Symposium arranged.
14	Committee I to discuss standardization of *taxonomy* with International Commission for Zoological Nomenclature.	Chairman of Committee had correspondence (2nd Proc., p. 18). No concrete action taken by Council.
13	Committee I to continue discussions with ICZN.	
18	Committee I to determine priorities for *taxonomic* studies. Possibility of assigning subjects to country institutions to be discussed at next Session.	Clupeoids and Scombroids recommended for early study (ibid).
17	Governments recommended to undertake *Taxonomic* research on seaweeds.	Not known.
	Hardenberg and Durand to be assisted in *classification* of *Rastrelliger* and Pangasidae.	Not known.
13	Governments to make available identification keys for preparation of general field keys.	Pending.
17	Field *keys* of common group to be prepared by competent workers with Standard List of English Names.	Not known.
	Weber and de Beaufort's *names* recommended for fishes irrespective of later synonymies.	(Can this be scientifically justified? Sec.)
17	*Taxonomic* monograph on 15 important groups of fishes to be proceeded with.	Author (Dr. Hardenberg) has drafted 3 sections.
17	UNESCO to be contacted re: scholarships abroad in *Taxonomy*.	Recommendation passed to UNESCO.
13	Reiterates need for field keys.	No general keys made available for publication by Council. Many keys prepared for use of trained biologists, one however available as a basis.
ND GEAR		
20	Committee to investigate extent of *surveys* of local *boats* and *gear* for 2nd Session. Governments to make further surveys.	A standard form of description agreed at 2nd Session.
8	Questionnaire on gear preservation.	Sent. Data from 5 countries.
14/38	Phillippines (Umali, Datingaling) to collate data.	No report.
14	Governments to inform on *gear preservation* and do research.	Research undertaken in Philippines and Indonesia. Two papers only received.
20	Governments once more asked to inform on *gear preservation*.	Data from several countries collated by Secretariat for 5th Session.
8	Questionnaire on *non-indigenous gear*.	Sent.
14	Governments to keep Secretariat informed on *non-indigenous gear* introduced.	Some response but not representative.

Session	Page	Nature of Resolution	Status
CRAFT AND GEAR—(Contd.)			
2	21	Governments to send working papers on research on *new* materials for gear.	No information received.
		Person to be selected to collate the data on gear.	No decision at 2nd Session.
		Collected information on gear to be published.	
3	14	Philippines (Umali), U.K. (Burdon) and Viet Nam (Tran Van Tri) to propose catalogue of gears.	Plans for a handbook on Gear postponed [4th Session Re
		Governments to send data by August 1, 1951.	Several alternative 'cla received.
4	19	Philippines (Umali) and Viet Nam (Tran Van Tri) to continue work on gear classification.	Classification considered comp ing preparation of handbook Res.).
3	14	Classification of fishing boats by U.K. (Gibson-Hill).	Completed.
4	20	FAO to be asked to supply *ETAP* Fisheries Engineers.	Requests from countries wil favourable consideration.
3	16	Governments to improve approaches to fishery harbours.	Known that actions were take countries.
FOOD TECHNOLOGY			
1	20	Committee to explore surveys of processing industries. Quality standards to be considered at 2nd Session.	General directive. No action at 2nd Session.
3	15	Classification of food processing methods by France (M. Lafont). Governments to send published material by August 1, 1951.	
3	15	Each Government to designate a food technologist to draft suggestions for a handbook.	Some nominations made. N reported.
3	14	Certain governments to supply information on processing.	This information stated to be Council referred to standard Proc. p. 56).
5	14	Two handbooks to be prepared.	Referred to General Editor.
5	14	Committee to study preservation in humid, tropical climate.	Technical papers awaited at
SOCIO-ECONOMICS, MARKETING, STATISTICS			
2	21	Governments urged to collect accurate statistics.	
3	15-16	Ibid.	
2	21	India, Indo-China and U.K. to meet and formulate scheme for guidance of governments.	Met several times and commendations made (3rd 39-41, 4th Proc., pp. 77-79) survey cited as a model Publication No. 29, 4th Se
3	16	*Statistics* training course approved.	Held, Bangkok, 1952.
3	16	*Statistics* to form a separate item on future agenda.	Item included.
3	12	*Statistics* group (France, U.K., India, FAO) to prepare pamphlets on statistical study of fisheries phenomena. Intensive pilot studies to be commenced in India, Pakistan, Thailand, Viet Nam, and Philippines.	Not received. No information.
2	21	Use of *Metric System recommended.*	
3	15	*Trade* survey by France (Lafont) India (Ranganathan) & U.K.	No report received.
4	19	Same group to advise FAO Fisheries Division on Trade statistics.	No report. Reference made FAO Statistical Yearbook p. 19).
3	15	Governments to submit papers on *Socio-economic* problems and indebtedness. Committee to submit proposals at 4th Session.	Several papers submitted mission by Committee (4 76). Papers will furnis vigorous development of Development awaited.
4	20	Committee to concentrate on improvements in marketing.	Symposium at 5th Sess papers invited for full disc Session. Awaited.

Page	Nature of Resolution	Status
CONOMICS, MARKETING, STATISTICS—(contd.)		
20	Contact FAO on *Marketing* specialist.	Replied. More specific request from governments would receive favourable consideration.
13	Fish *marketing* training centre.	Held, Hong Kong 1954.
102	Priority to improvements in *marketing* including co-operatives. Government credit to be gradually withdrawn.	Results awaited at 6th Session.
ES DEVELOPMENT		
15	Inter-Committee Working Group for Fisheries Development constituted (Australia, Netherlands, France, India, U.K. and U.S.)	Chairman (U.S.) advised on Feb. 24, 1954. Report awaited.
L		
15/34	Terms of reference laid down for Council's Committees.	—
6	Constitution of Committees. Persons likely to be delegates at next Session to serve. Committee members recognised as correspondents for liaison with technical workers.	Member Governments advised.
8	Council to establish project priorities.	—
8/9	Collaboration with South Pacific Commission.	—
9/37	Bibliographic programme.	See Working Paper 2-A.
	Register of Institutions.	In press.
14	Survey of Institutions etc.	,,
9/37	,, ,,	,,
9	,, ,,	,,
9	Handbooks.	Prospectus only.
22	Governments to keep Secretariat informed in January of each year of all technical fishery programmes and progress thereon together with names of workers.	Some Governments inform Secretariat prior to each meeting on important projects. Others have failed to report. Names of workers have not been communicated.
10	Current news to be channeled through the Secretariat.	See Current Affairs Bulletin. Information not consistently channeled to Secretariat and only in reply to specific requests.
17	Regionalization.	Dropped at 4th Session.
8	Bibliographies.	,,
9	Handbooks.	,,
10	Governments to emphasize training of personnel.	Many governments have organized such courses. FAO has organized regional centres on Council recommendations.
16	Secretariat to assist governments in obtaining equipment.	Advice given as required.
16/17	Rules for presentation of technical papers.	Authors do not as a rule observe these rules.
7	Rules for scope of technical papers.	,, ,,
8	UNESCO correspondents.	Nominated.
7	Recommends increased scope of technical assistance, joint request for technical aid and attachment of specialists to Regional Office staff.	Scope is increasing. No joint requests yet received (see Hilsa project in which Pakistan might join with India). Request communicated to FAO but it has not yet been possible to attach specialists to staff, for financial reasons.

APPENDIX II

STATEMENTS BY MEMBER GOVERNMENTS

STATEMENT OF THE AUSTRALIAN GOVERNMENT

The various organisations connected with fisheries in Australia have indicated that although the IPFC has had little direct influence on Australian fisheries the scientific meetings of the Council have been a valuable factor in emphasising the possibilities of our warmer estuaries and lagoons. The exchange of expert views has provided perhaps the most useful contribution from an Australian point of view. In addition, the publications of the Council over a wide field of general fisheries have been of considerable benefit.

Work of IPFC and Australian Territories

Influence of IPFC on Australian Territories.

It cannot be said that the Indo-Pacific Fisheries Council up to the present time has had any appreciable effect on the Fisheries of the Territory of Papua and New Guinea. Results of work given in some papers published by the Council, however, if put to practical use in the Territory, may in a few years completely change the way of life of a large proportion of the native population. The activities of the Council have stimulated interest in the Indo-Pacific region on a considerable scale but only those countries with an established controlled fishery have benefited in a practical manner.

Until a plan of fishery development in New Guinea is in operation, it is not possible to state specifically what lines of development of the Council's future activities will be most beneficial, but broadly the needs in New Guinea are :

Sea Fisheries : (*a*) Providing assistance (not always financial) in procuring gear, such as nets, cordage, etc.

(*b*) Technical instruction on methods of preserving fish on a large scale by salting, drying and smoking, and developing methods of distribution.

(*c*) Increase in vessel size and mechanization of part of the fishing fleet.

(*d*) Development of a mobile refrigerator to carry from several hundred pounds to one ton fish.

Fresh Water Fisheries : In the highlands, the introduction under expert supervision of fish and suitable food organisms, could in a few yea a large supply of fish for both natives and I

At only a short distance from the coas practically no trade in fish and difficulties i preclude any appreciable development years. Low level ponds could be profit tructed inland some distance from rivers.

If fish production can be demon numerous small ponds, it is probable t on their own initiative will take up the w of development in fisheries in many places of local customs which will not change is a completely new development such culture which only indirectly affects customs.

WORK OF IPFC AND AUSTRA

In some minor respects, the work o being used in Australia. For example, t Tilapia has created interest, because of for suitable fish for stocking inland ponds

As the population of Australia is mai southern (temperate climate) latitudes, Australian fisheries are concentrated in latitudes, much of the present work of have little influence on these fisheries development of northern (tropical) waters there are certain problems which might b tered. In this respect, work on tuna and sub-tropical latitudes might bri benefit to Australia's fisheries.

As regards suggestions as to the lines a the development of the Council's future would be most beneficial, it is felt that no designed specially to benefit Australia should be made at this stage.

As previously mentioned, Australia is in tuna stocks in the northern waters, operations are being planned for these s benefit could be drawn from reports activities in other parts of the region. though, it is felt that any suggestion eman Australia at present should have in view of the majority of countries in the are regard the Australian viewpoint is th should be given to those activities which

d to produce tangible results in the way of ed production in the short run.

e fully appreciating the value of long-range ic work, it is felt that the Council's work place greater emphasis on the practical side ng.

STATEMENT OF THE CAMBODIA GOVERNMENT

ust be stated that the work of the Indo-Pacific es Council has had a beneficial effect in our r. In fact, it is owing to the annual meetings Council that Cambodia has been enabled to together a very important documentation vhich it has consistently profited, notwith- g that its National Fisheries Service is still phase of organization. It is on the basis of hnical and scientific information so collected e have successfully directed the organization Service towards future progress. More- he advice and suggestions of the different er States have enabled us to undertake several gations previously untouched which will otedly contribute to the gradual improvement exploitation of our aquatic resources.

STATEMENT OF THE CEYLON GOVERNMENT

as apparent that until an adequate staff was le to carry out an integrated programme of development, no significant measure of ss could be achieved. Particular attention ven to this problem in the early months of 1950 instance of the Ministry and Dr. Kesteven, es Representative of the FAO in South East These proposals were examined by the ıment which accepted them almost in their y.

re-organization of the Department has been d towards effecting by governmental action, ariety of ways, the complete re-organization fishing industry. The industry functions at level of efficiency, chiefly on account of the ve methods followed in every operation, er it is fishing, processing or marketing. It been necessary that Government should uce a degree of mechanization in capture and ing methods, at the same time improving the rd of living of the fishermen and their families. er to provide an administrative structure under this progress might be achieved, the activi- the Department were apportioned under three ns, viz. Administrative, Development and ch. The first deals, on the one hand, with tters relating to administration, establishment, accounts, legislation and its enforcement, registration, licensing and statistics, and on the other hand with the activities emanating from the welfare of the fishing population which specifically includes finance, insurance schemes, roads, settlement of disputes, fishermen's stores and the dissemination of knowledge and propaganda regarding progressive means of improving the industry. The Development division involves Co-operative organization and training and cultural operations in brackish and inland waters; on the secondary industrial side, it deals with all activities such as refrigeration, ice-making, processing and transport. The Research division deals with all types of research both pure and applied. The biology and hydrology branch will cover the bionomics and ecology of marine, brackish and fresh water fishes and their commercially important products and hydrographical, hydrological and biometric work; while the technology branch works on the problems of fish processing and preservation and the utilization of marine produce.

In accordance with the resolutions passed at the 3rd Session of the Indo-Pacific Fisheries Council on the survey of the research programme on pelagic fish stocks, an officer of the research division has been nominated to participate in the programme of international research on the species of Rastrelliger.

With the appointment of an Algologist to the Fisheries Department the study of the Genus Gracilaria has been taken up and results of investigations carried out reveal that extensive beds of *Gracilaria confervoides* and *Gracilaria lichenoides*, are available and that this material can produce Agar of good quality in commercial quantities, research work is being continued on methods of extraction and purification of raw material. This follows from resolution No. 10 of the 3rd Session of the Indo-Pacific Fisheries Council. Interested trade representatives have been informed of this work which has been published in the Ceylon Trade Journal.

The Statistical Officer, Mr. G. N. deSilva, attended a course of instruction at the Indo-Pacific Training School for Fishery Statistics at Bangkok. The techniques of collection of statistical information on many of the phases of the industry were touched upon with practical demonstrations. This should be followed up with further training courses, the aim being to make the statistical reports and the statistical collection systems uniform in the South East Asian Region, as suggested at the Fisheries Conference in New Delhi in 1948. Mr. C. Kandasamy, Divisional Fishery Inspector attended a training course in fish marketing sponsored by the Indo-Pacific Fisheries Council at Hong Kong in July, 1954.

DECLARATION DU GOVERNEMENT FRANCAIS

Enfait le travail du Conseil Indo-Pacifique des Peches n'a pas eu une très forte influence sur les pêches dans les territories français. Cela tient surtout a ce que les territoires français situés dans la zone Indo-pacifique : les Etablissements Français d'Oceanie et la Nouvelle Calédonie n'ont pas pu benéficier jusq'ici d'un effort considérable dans le dévelopment des pêches de la part du gouvernement français car ce dernier a du employer ces moyens a des actions plus urgentes dans ses territoires africains.

Toutefois une impulsion nouvelle est actuellement donnée aux récherches concernant la peche en Nouvelle Caledonie qui pourra de ce fait benéficier plus efficacement des travaux de Conseil et leur apportera en contre partie une contribution plus active. Mais cela ne signifie pas que la France n'ait retiré jusqu'ici aucun bénéficie de l'action du Conseil. Les informations qu'il a rassemblees, les etudes et actions realisees sous son impulsion, specialement en ce qui concerne la pisciculture, ont constitué pour elle une aide precieuse pour le développement des pêches dans ses territoires tropicaux.

Le gouvernement français southaîte que dans l'avenir le rôle du Conseil en tant que foyer de renseignements et organisme de synthese de resultats soit maintenu et developpé.

STATEMENT OF THE INDIAN GOVERNMENT

In India, the Central and some of the State Governments have been implementing, since 1946, certain well-considered programmes for the development of fisheries in the country. In addition to other work, the Central Government have established two Fisheries Research Stations, with a number of Sub-Stations, for undertaking research on problems connected with marine and inland fisheries. A Central Deep-Sea Fishing Station has also been established for undertaking exploratory fishing, charting of fishing grounds, training of personnel and similar other work. These Stations are working according to definite programmes. The State Governments also have taken action along several lines for developing their fisheries.

As India has had a proper programme of work and trained personnel for the development of fisheries, the effect of the work of the Indo-Pacific Fisheries Council on the fisheries of the country has not perhaps been as well-marked as in some countries in the region where development was at a somewhat lower level. In India also, the Indo-Pacific Fisheries Council have, however, contributed, to a preciable extent, in the planning of new progr and in modifying the older programmes recommendations and resolutions of the and the discussions in the various session been carefully taken into account in form new programmes of work and in modifyi existing ones.

Among the benefits directly derived by from the work of the Council, the following mentioned :

(1) The contacts established, throug Council, with fishery workers and lists in the region have be considerable value. The advice Secretariat of the Council has als very helpful.

(2) Valuable information on fisheries has been obtained through te papers, proceedings of session symposia, hand-books, special p tions and news bulletins issued Council.

(3) We have participated, with advan us, in the seminars on fish culture tics and marketing.

(4) The undertaking of co-operative r programmes, on which India ha very keen, is likely to prove be not only to us but also to som countries in the region. Program work on the Hilsa and Rastrellig been initiated and, though progr to-date has not been very subs it is expected that these will p considerable benefit.

(5) The introduction of the culture of in some countries of the regio varying results, had been und without preliminary trials and in tions. Before deciding on the cu this fish in India, thorough invest are being undertaken, in cons with the I.P.F.C., who appear t appreciated the cautious attitude o in this matter. On the basis already obtained, the culture of in certain parts of India has been recommended.

(6) India has been pressing for the es ment of a Centre in the region fo ing fishermen in mechanised As the Council was unable to un this work and recommended the es ment of training centres at sub- or national levels, India, in cons

with the Council and with the help of an F.A.O. expert, has already started one centre near Bombay and is proposing to start two more centres shortly in Madras and Travancore-Cochin. The curriculum and equipment, etc. for the centres have been decided in consultation with the Secretariat of the Council and F.A.O.

Though India has been implementing a programme for the mechanization of indigenous fishing craft for several years past, the consideration of the question of boat designs and of their modifications, wherever necessary, has now been included in the programme, as recommended by the Council. The services of a Naval Architect provided by the F.A.O. are being utilized for this purpose.

gh in the early stages, the work of the was mostly of the nature of surveys, codifi- of existing knowledge and conditions, etc. us countries of the region, it is gratifying that s now been re-oriented on more practical at are likely to help the fishing industries egion. It is necessary that more and more n be paid in future to work of this kind. ination of information, exchange of data and lated work will no doubt have to continue ill be of great help if more emphasis is placed rammes of training and other work that will benefit the fishing industries and the fisher- the region.

of the lines of work to which special atten- y be paid are mentioned below :

Assistance in the form of equipment, including vessels, for co-operative research and exploratory programmes like those on the mackerel and the hilsa etc.

Assistance in the form of equipment and experts for undertaking fishery development in large reservoirs already constructed or in the course of construction as a result of river valley projects.

Culture of fish in paddy fields.

Development of suitable methods for fishing in large estuaries, like those of the Ganga, Brahmaputra, etc.

Establishment of a regional oceanographic institute with assistance from some specialized agencies of the United Nations.

Improvement and standardization of cured fish.

Organization of fish marketing, specially on co-operative basis.

STATEMENT OF THE INDONESIAN GOVERNMENT

In various respects, the work of IPFC is being taken into serious consideration in Indonesia ; this is to be seen, for instance, in the setting up of the National IPFC Committee soon after the 5th (Bangkok) Meeting. The constitution of this National Committee was confirmed by the Minister of Agriculture. Besides IPFC matters, the Committee considers domestic fisheries problems, both as regards the administrative and technical aspects.

Indonesia regulates its administration in the field of fisheries through two separate departments ; the Sea Fisheries and that of Inland Fisheries, both in the Ministry of Agriculture. Certain well-considered programmes in the development of the fisheries in the country have been set up with governmental, as well as technical aid, eg. :

(*a*) ' Special-Welfare-projects ', (R.K.I. = Rentjana Kesedjatherdan Istimewa) of the Republic.
(*b*) Technical aid from I.C.A.
(*c*) Technical aid from the Colombo Plan, embracing the building of fishing-boats, equipment to fisheries-stations, educational matters (fellowships), etc.

In its concern for the betterment of people's diet, including fisheries, the government, among other things, has established :

(*a*) ' Nutrition Board ', (Panitya Perbaikan Makanan Rakjat), now headed by the Minister of Health, of which the Minister of Agriculture is a member.
(*b*) ' Committee for the increasing of Agricultural Products ' (including marine and inland aquatic products, the Panitya Penambah Hasil Bumi) which is an interdepartmental organisation headed by the Secretary-General of the Ministry of Agriculture.
(*c*) The importance of the cooperative way of operation and better return to fishermen in accordance with better conditions of living is still felt as one of the final goals in which all means of development of all kinds of fisheries actually must result.

Both permanent organizations consider that animal-protein, which is considerably lacking in the people's diet (8 kg. per head per annum) at present can be derived quickly from aquatic resources by means of improvements besides the efforts taken in other fields.

The Laboratory ' for the investigation of people's diet', the so-called Balai Penjelidikan Makanan

Rakdat, is still aiming at the goal of having a consumption-quantity of 20 kg. per head per annum, which requires a considerable amount bearing in mind the 80-million population. The present actual catch from all kinds of aquatic resources is approaching the 600,000 ton figure; the potential capacity assures Indonesia in its self-support spirit in respect of animal protein supply.

The resolutions, recommendations and discussions during various Sessions, as well as certain important papers and publications of IPFC have been taken into account in facing fisheries problems.

Among the benefits derived by Indonesia out of the Council's work, the following are worth mentioning:

(*a*) More trained and broad-minded personnel as a result of organized training centres and seminars:

(1) Statistical Training Centre in Bangkok.

(2) Fish Marketing Training Centre in Hong Kong.

(3) Seminar/Training Centre in Inland Fishery (Indonesia).

(*b*) Communications between Indonesian fishery workers and other experts and specialists. The advice of the Council's Secretariat has been of considerable value.

(*c*) The possibility of obtaining valuable information out of the various important papers, publications, and symposia.

(*d*) The contact with Rome (FAO) experts through the Council.

(*e*) The National IPFC Committee has discussed the possibility of introducing the Otoshiami (a trap net), in connection with the modification of this important non-indigenous gear to the usual SERO, a stationary bamboo-trap gear (a programme for 1956 by the Sea Fisheries Department). The principle of movable operation of this trapping system of gear will be technically of great importance and shall be proved by preliminary experiments.

One most important significance in the line of evolution of the Council's work in the past is the gradual change from activities along the line of surveys (earliest stages) to the trend of having discussions on practical use of fisheries science, data and methods, in its goal for achieving improvements in the region. This is of great importance for future targets in the development of the Indonesian fisheries.

Special interests to which the Council m more attention can be stated as follows:

(*a*) The continuation of arranging edu projects as Training Centres or S in the region (as it is in conform the efforts of Indonesia in its edu

(*b*) The importance of fish culture in ric which can be felt as beneficial to t part of the Indo-Pacific region respective large number of pop taking into consideration the fact extreme importance of rice and fis main diet of this part of the world. study, even a sub-committee for the Council, dealing with this im combined culture for a number will be of great value. On simil the Council has special sub-com on *Hilsa*, *Chanos* and *Rastrellige*

STATEMENT OF THE JAPANESE GOVERNMENT

Japan highly appreciates the Indo-Pacific F Council for its work of promoting the exch data and information on the fisheries which h hardly available to any of the member c before its establishment.

The international cooperation throug machinery of the Council has contributed t clear various bottle-necks which had i the development of the fisheries of many c thus enabling these countries to adopt more a methods for further development of their fisheries.

However, it is the view of Japan that mos activities will not prove effective in a short time because of the nature of research an should be more time before the influence o activities on the fisheries of this country definitely evaluated.

It is the desire of Japan that the operatio Council will be re-examined from time to that its activities can be carried on success accordance with its objectives.

STATEMENT OF THE REPUBLIC O KOREA GOVERNMENT

Suggestions

It is suggested that a special group of worl fisheries specialists be established under I direct the development of the fisheries ind each of the member countries by regular visits to each nation (their expenses to be appr from the budget of IPFC).

ıod of Fish Catching

is recommended to study progressive and ɔved methods of fish catching by collecting us materials from the specialists of each Mem-Government of IPFC. Looking back over the ous results of discussions and study from the hrough the 5th Session of the Council, it is ght that the encouraging and leading of each try to adopt improved and internationally ɔted methods of fish catching has not yet been ved. In other words, what we have already ıed has been hardly more than listening to each ber country's fish catching problems. The nt situation in Korea is that the fishermen nly following the results of research and in-gation by the local fisheries laboratory.

hod of Culture

ore detailed and exact methods for the culture h in the frigid waters should be studied multi-ally, and this is Korea's main interest in this It is believed that 80 per cent of the activities PFC have been devoted to fish culture. Most ıe bulletins dealt with at each Session have concerned with this field, and, accordingly, cultivation has been a main subject of discus-at each session. Especially tropical fish culture ɔeen a focus of attention and it has made remark-progress. The Government of the Republic ıe Korea, as a Member Government of IPFC, tisfied with the achievement.

hod of Processing

ıe study of processing the sea foods suitable to tastes of each nation in different geographical tions is necessary, because the member countries situated in different climatic conditions over areas, some in the frigid zone, and most of between the tropical and sub-tropical zones. until the 4th Session after the creation of C, the methods of processing the marine food ucts were not considered to be important, and a committee for the study of the marine food pro-s was not formed until the 5th Session. It is ved that research in this field will be speedily oved and it has also to be studied scientifically ıse this problem directly affects the economic ation of food sources for mankind.

abilitation of Economy of Fishing Villages

concrete way has to be found for the poor fisher-to maintain their independent living. A com-ee has been established by the Council in order udy the economy of the fishing villages and it nade a great contribution. But concrete recom-lations in this respect still have not been found. The fishermen continue to exist under poor and unimproved living conditions.

Fish Distribution and Marketing

In recognizing the generally poor sanitary facilities as a serious bottleneck to the smooth distribution of fisheries products from producers to consumers, and in providing for training of specialists of the Member Governments to improve such conditions, the 4th and 6th Sessions of the IPFC rendered a great service to member countries. It is recommended that such projects be continued to improve the primitive and unsanitary fish market facilities, and that studies concerning the provision and improvement of transportation facilities be continued accordingly, to insure the fisheries products to be distributed and marketed in a fresh condition.

Fisheries Statistics

Since the first research meeting concerning fisheries statistics held by the decision of the 3rd Session of the Council, great results were gained, but it is felt now that the project has been discontinued. To obtain a proper understanding of the fishing industry, continuous attention to securing exact fisheries statistics has to be maintained in the future.

Recommendation

It is apparent that intensive research into practicable methods for developing all the aspects of the fishing industry has to be undertaken. Accordingly, as indicated at the beginning, it is recommended that a full time group of internationally recognized authorities in each field should be created to direct and improve the fisheries industry in each of the member countries, suggesting immediate action or giving advice whenever necessary.

STATEMENT OF THE NETHERLANDS GOVERNMENT

To assess the influence of IPFC activities from the creation of this Council in 1948 till the present time on the fisheries of Netherlands New Guinea in a few words, would be a difficult task.

Since 1950 when a Fisheries Division was established in this Territory, one delegate and later two delegates attended the Council's Sessions.

From these sessions, a great many data were assembled, which contributed in no small way to the planning and executional stage of the development of the territories fisheries.

Before 1950 the fisheries research in Netherlands New Guinea was still on a very modest level. At

present there are positive signs of a gradual expansion and development. Many investigations and experimental fishing projects were carried out by the Fisheries Section, often directed by results of similar experiments obtained from IPFC papers and discussions.

A very important item of IPFC and its Sessions lies in the possibility of close contact with experts and executives of other countries, both inside and outside the area. From these contacts valuable relations have resulted.

Through their delegates to the Council's Session at Manila in 1952 and also at the last Session at Bangkok in 1954, the Government of the Netherlands expressed its desire to bring the activities of the Council in more direct relation to the fishing industries of the different countries in the area, in other words, the Council was advised to keep in mind, that its work should be of immediate benefit to the millions of fishermen in the area.

In its opening statement at the Council's last Session the delegation for the Netherlands demanded priority for work having a direct bearing on the fisheries industries and to projects which might be expected to give results in a reasonably short time.

The following projects, of which can be expected short time results, should be mentioned :

1. The program for technical assistance and instruction. These programs should be continued and expanded and if necessary, more funds should be provided.
2. The program concerning the preparation of handbooks on fish handling, processing of fisheries products, storing of dried fish, in particular describing suitable methods for use in hot and humid climates.
3. The distribution and exchange of data concerning the smaller types of most suitable fishing craft and mechanisation of these craft.
4. Specific information about the production of ice, the storing of fish and fish products, especially for the fisheries of hot and humid climates.

STATEMENT OF THE PAKISTAN GOVERNMENT

A. Influence of IPFC activities on Fisheries in the Indo-Pacific Region

1. Co-ordination with FAO and other organizations like UNESCO and other sister Councils.

2. The discussions at the Sessions help in co-ordinating the fishing activities of different countries situated in the region. The delegates meeting exchange ideas, gather information from countries and also collect data which become useful in increasing exports.

3. Joint programmes are evolved by mutu cussions. One example is the ' Hilsa Invest programme ' which is being worked out join Burma, Pakistan and India. The Hilsa fi are common to and are of great importance t countries. Research and investigation carrie so far individually are important but will greater value on co-ordination.

Other joint programmes of such a nature, carried out on tuna, sardines, shrimps, etc. O graphy and mechanized fishing are other pr which can be of great advantage, are also organized by IPFC.

4. The office of IPFC supplies very va information on fisheries and at times is respo for getting valuable data from other cou and informs all the Member Governments of ent fishing activities in the region.

5. The Sessions held in different countr the region provide opportunities to the de for observing the methods of fishing ma and other aspects of the fish industry etc.

6. IPFC has been responsible in recomm to FAO some training programmes. A example :

(*a*) Fish Culture courses in Indonesia.
(*b*) Fisheries Statistics course in Thailand
(*c*) Fish Marketing course in Hong Kong.

These were very useful practical courses region sponsored by FAO/ETAP on the ini of IPFC. Some other courses on mech fishing, training of fishermen, etc., have also recommended by the Council.

7. The Bulletin published by the Counc very useful publication which gives a review fisheries of the region and also movements Officers of FAO and IPFC.

B. Review of recommendations of IP and their implementation

IPFC was created under an agreement at Baguio (Philippines) in 1948. Mr. A. M. Deputy Secretary, Ministry of Food and Agric attended as an Observer from Pakistan but Pa was not one of the signatories of the Agre The first Session of the Council was h Singapore in 1949; no delegate from Pa attended that Session. Pakistan was, ho represented regularly from 1950 onwards.

Session, Cronulla, Australia (1950)

ıe resolutions passed at the 2nd Session mostly erned collection of data and stressed the survey shery resources in the region. As implementa- of these resolutions, a survey of the fishery ırces of East Pakistan was conducted by Dr. L. Kesteven, FAO, Regional Fisheries Officer Asia and the Far East and Dr. S. W. Ling of same Organization and a report was submitted ıe Government of Pakistan. A survey of the ry resources of the Mekran Coast was conducted ishery Officers of Pakistan and a report was sub- ed to the Government.

ıother problem on which information was asked in this Session concerned the introduction of indigenous gear. A report 'On trawling in stan' and details regarding the vessels and were submitted to the Council at this Session.

uring and after the Session fishing activities, ially purse seining and Danish seining were ied at sea, and canning, liver-oil production ories were visited at Eden and Melbourne. ter culture operations were observed near ıulla. After return from Australia a proposal get seven fishing boats, mechanized gear and s were sent to the Colombo Plan in order to oduce mechanized fishing in Pakistan. This posal of the department was, however, not imple- ted.

Session, Madras, India (1951)

Important resolutions :

(*a*) IPFC/51/20.3(3) Hilsa investigations (p. 12 of the 3rd proceedings).

onsidering the importance of fisheries for *Hilsa* Burma, India and Pakistan a Sub-Committee formed. Later a meeting of this Sub- mmittee was held at Calcutta, where different cts of the problem were considered. Work done vidually so far was reviewed and papers were ented by workers from Pakistan and India. as resolved that a programme of work should be ved, a unit formed for these investigations, and .O. approached through IPFC for funds technical assistance. It was also decided that workers from all the three countries should t at Calcutta for finalizing such a programme. istan on her own has started investigations in Indus river and preliminary work in East Pakis- is also being done. Government of Pakistan agreed to participate in the joint programme, Hilsa investigation which has been sanctioned the Food and Agriculture Council for West istan and a scheme for East Pakistan has also n sanctioned.

These investigations will to a great extent help in reviving the Hilsa fisheries which are very important to Pakistan besides India and Burma.

(*b*) *Fish Culture.*—On the recommendations of IPFC at the same Session, Mr. W. H. Schuster was deputed by FAO for a period of three weeks to East Pakistan to survey freshwater fishery resources and recommend ways and means to increase fish production specially in paddy fields. The recommendations are being implemented. *Tilapia*, an exotic fish, recommended by Mr. Schuster, was obtained from Thailand and introduced in East Pakistan where it has established itself. Some other exotic fishes of proved value are being imported for East Pakistan and Punjab as an experimental measure.

(*c*) Resolutions regarding control of weeds, pollution of water etc., are being implemented.

(*d*) Work on the taxonomy of important fishes as recommended has been taken in hand. A small book on 'The Fishes of Karachi and the Coasts of Sind and Mekran' is in the press and is expected to be released shortly.

(*e*) *Gear Technology.*—As per resolutions of the Council it was planned to have two research vessels and different types of mechanized gear. The gear has been received but the vessels could not be procured till now. Attempts are being made to procure these two vessels under the Colombo Plan. One 65 feet purse seiner-cum-shrimp trawler has been received through FOA of U.S.A. and the same Organization is also providing a small inshore fishing boat. A survey of the indigenous methods of fishing has been conducted, and a report will be submitted to the Council in October, 1955.

Thus it will be seen that IPFC has been giving guidance to Pakistan and other countries in improving their fishing methods.

(*f*) *Mechanization.*—Under a resolution it was recommended by the Council that the fishing boats should be mechanized in the Indo-Pacific region and on the recommendation of IPFC a Naval Architect was provided for Pakistan by FAO who worked for two months under instructions from Mr. Jan-Olof Traung of FAO, measuring the fishing boats. Later tank tests were conducted at Rome and Sweden. The final report is expected soon. The mechanization of fishing boats will be very helpful in increasing production of fish in Pakistan and giving better returns to the fishermen.

Other important items considered at this Session were Socio-economic problems and regularizing the collection and compilation of statistics. These problems are being tackled.

(*g*) *Marketing*.—Special importance to marketing of fish has been laid on improving the marketing facilities for fish as it has been considered that marketing in the Indo-Pacific region is in a very bad state. On the recommendation of IPFC two experts were obtained from FAO to survey the marketing conditions in East Bengal. Messrs. Nils Jangaard and Harald Fibiger in 1952 toured extensively that region and submitted their report to the Government of Pakistan on ' Fish Marketing in East Bengal '. A scheme has been received from the East Bengal Government for transport of fish from Sundarbans area. Marketing of the fish so collected will be manipulated from Khulna.

4th Session, Quezon City, Philippines (1952)

Besides the problems as discussed above, special attention was drawn to the following problems :

1. *Handbooks* be written by specialists on the following subjects and for the preparation of such handbooks data should be provided by all the countries of the region :

Fish culture,
Food technology,
Administration and Development,
Fishery Statistics,
Gear classification,
Food processing,
Fishery Biology,
Marine Biology and Limnology,
General Introduction to Fishery Science.

These handbooks will be of great use to the workers in the region as a lot of information will be available. These will be all the more important as such books are not available anywhere. The data has been collected for some and was supplied for some items in 1952.

2. Other items which were given special attention were :

(*a*) Fisheries relating to crustacea and molluscs,
(*b*) Neritic Pelagic fisheries which is the mainstay of our fishermen,
(*c*) Control of noxious weeds,
(*d*) Fish culture,
(*e*) Hilsa investigations by Burma, Pakistan and India.

3. On the technological side seaweeds as a source of food and raw material for by-products were considered. Information was asked for from Japan, U.S.A. and Australia. A working group was formed to consider this aspect thoroughly under *Gear Technology*. A working group was formed to classify the indigenous fishing gear which may be a guide for all countries of the Indo-Pacific region. Special attention of all Member Governments was drawn to the Socio-economic asp the fishermen and they were asked to give p to the marketing of fish.

The delegate from Pakistan observed trawling, indigenous fishing specially by bright oyster culture, biological and technological re stations, training school for officers and fishe

5th Session, Bangkok, Thailand (1954)

Eleven resolutions were passed by the C Out of these No. 2 related to the survey of resources of all the countries in the region. S attention was drawn to the faunal changes occ rapidly and it has been requested that the governing these changes may be studied and a submitted at the next Session.

With the arrival of the new fishing ves January, 1956 the work envisaged in the reso will be taken up and a report will be subm Some data have already been collected by *ALA* and are under compilation.

In resolution No. 3, Member Governments been asked to study the problem of polluti the streams and other waters and that rem measures should be taken to save the fish.

The matter has been taken up.

Resolution No. 4 draws the attention o Member Governments to the adverse effec dams to the migratory fishes. It is advised proper action should be taken to safe-guar fisheries of the rivers when planning a dam an suitable fish ladders should be provided.

This problem has been engaging the attenti the Government specially in the case of Lower Barrage which will effect the migration of (*Hilsa ilisha*). Since the fish ladders have constructed their efficiency will be studied a not found suitable, other remedial measures w suggested.

In resolution No. 5 it is suggested that fish cu should be intensified to increase production along with this the craft and gear should als improved.

Fish culture is at present practised in the P and East Pakistan. In 1953 *Tilapia* was introd in East Pakistan and in 1954 round Haleji lake Karachi. The results in East Pakistan are pr ing and a greater number of *Tilapia* is being obt for that region. For regions in West Pak different types of exotic fishes are being obt from India, Thailand and Indonesia. These be cultured in fish ponds near Haleji lake and distributed to Punjab and other places.

ution No. 7 puts emphasis on the training of el in mechanized fishing and FAO has equested to start Centre(s) for imparting l training to personnel of different countries the fishing craft and gear may be improved ined fishermen may be available to use im- types of nets.

ave already done the preliminary work on chanization of boats in collaboration with The final report is expected early in 1955 n the actual work will be taken in hand.

r problems to which attention has been drawn

tudy of Plankton :

problem is now being studied only in creeks o suitable vessels are available with us but it ed to extend it to the sea on the arrival of boats and equipment.

Pelagic Neritic Fisheries :

es on mullets and sardines are being carried l investigation of Tuna has started.

Hilsa Investigations :

mes for the investigation on Hilsa have nctioned by Food & Agriculture Council of a to start work simultaneously in both wings. ment of Pakistan have shown their willingness the projected joint research on 'Hilsa' ed by the Government of India.

Reports are being prepared for submission Council on the following :

Methods of curing,
Description of the fishing gear,
Marketing of fish,
Information on Tuna,
Hilsa investigations,
Symposium on prawn fisheries.

C. Suggestions

More attention should be given to the practical of fisheries. There is great dearth of ans in the region. Priority should be given training of fishermen in mechanized fishing. ficulty is about language. It is suggested officer should accompany the fishermen who benefited by the training and serve as inter-

There is great need of appointing one specia- fish culture in the Regional Fishery Office and the Far East at present located at Bang- e should be available to all countries for riods whenever his advice is sought.

A specialist on fish marketing should also be on the Staff of the Regional Fishery Office for consultation and advice.

3. Member Governments should be asked to provide funds to their delegates for post-session tours so that they may gain practical knowledge of the fisheries of the country where the session is held.

4. Adjacent countries having common problems be asked to coordinate and evolve joint programmes for different aspects of fishery problems on the lines as has been done in the case of Hilsa Investigations. A similar programme can be evolved on the exploration of fishing in the sea.

5. Each country should try to hold meetings of their fishery workers at least once a year to discuss their problems and to chalk out their own programmes.

6. Adjacent countries should also hold meetings for the discussion of common problems at least once a year. The time should be fixed after 6-8 months after the session of IPFC so that the recommendations of the Council may be reviewed and ways and means to implement these problems may be discussed.

STATEMENT OF THE PHILIPPINES GOVERNMENT

Membership in the Indo-Pacific Fisheries Council has made it possible for the Philippine fisheries specialists to have direct contact with different fisheries specialists of other member countries in the Indo-Pacific area. The contact has promoted interchange of technical information and experiences. New ideas found adaptable under Philippine conditions have been assimilated.

The regular Sessions have given the local technical men the opportunity to see for themselves laboratories, methods and techniques, field practices and development programmes which have broadened their outlook. These things which they have observed for themselves have, in many instances, influenced the change of existing development programmes towards the right direction. Furthermore, the implementation of resolutions of the Sessions has made it possible for us to give greater incentive to increase the production from fisheries. This is especially true in the case of the expansion of fishpond areas and the promotion of fresh-water fish culture.

The introduction of fresh-water species for fish culture purposes, especially of Tilapia obtained from Thailand in 1950, and the subsequent wide distribution and popularization of this fish for cultivation

in backyard fishponds and inland fish farms are among the tangible results gained through this country's membership in the Indo-Pacific Fisheries Council. The culture of Chanos in fresh-water ponds and the fertilization of pond water to increase production per unit area now under experimentation locally have been influenced by successful practices along this line observed by our delegation in India. Investigations on the improvement of the preparation of fish paste and fish sauce were inspired by the results of researches on *nouc mam* in Cambodia. The efforts exerted in pushing fisheries development programmes and researches on the different phases of fisheries science have been influenced by membership of the Philippines in the Council.

It may be mentioned also that training centres and seminars which have been held under the auspices of FAO and certain Member Governments as hosts were observed to be useful, not only in the methodology and techniques assimilated by the trainees and later adopted in their respective fisheries agencies but also in the promotion of goodwill among member countries. Even if the Philippines has not as yet had a chance to be a host country in an FAO project of this nature, it has been for the past few years admitting trainees in fisheries from the neighbouring countries, namely, Thailand, Burma and Indonesia.

STATEMENT OF THE GOVERNMENT OF THAILAND

Thailand has benefited from the Indo-Pacific Fisheries Council as follows :

1. The Secretariat of the Council has been of assistance in establishing contacts between the Thai Fisheries Department on the one hand and fishery workers of the region and fisheries institutions outside the region on the other.

2. Fisheries information collected by the Council on technical and socio-economic matters and on methods of tackling the problems, has been very valuable.

3. Thailand is proud of its progress in fresh water fish culture development and attributes this in part to FAO technical assistance and to the Fish Culture Training Centres arranged by the Council. The junior fishery officers who have received this training have been enabled to carry on active work in fish culture technique and extension.

The training of fisheries personnel for the member countries is therefore believed to have been one of the noteworthy achievements of the Council.

4. The proposed handbooks to be wr specialists on fish culture, food technol ministration and development, fisheries fisheries biology, fisheries science etc. wi great value to workers in the region.

5. The formation of the Hilsa and Ra Sub-Committees will be most stimulating fisheries programmes of member countries the creation of mutual understanding and w positive benefit to the fisheries concerned.

6. The recommendations of the Coun made the Member Governments aware of tence of the fisheries problems and the for the proper management and utilizatio resources.

7. It is recommended that means be s expand the Council's permanent staff by the of specialists to meet the varying needs of the countries, so enabling the Secretariat to e technical problems in addition to the h ministrative duties with which it is at pres occupied.

STATEMENT OF THE UNITED KING GOVERNMENT

(FEDERATION OF MALAYA AN SINGAPORE)

The Indo-Pacific Fisheries Council has yet, had any marked influence on the fishing in the Federation of Malaya and Singapo Council and its activities have, however marked and beneficial influence on the sta Fisheries Department which it would ha extremely difficult to achieve, had the not existed. With the passing of time confidently be expected that this influence transmitted to the fishing industry, but it realised that it will be over many years fisheries generally, we are handling a na source and Nature is slow. Secondly, fi by the nature of their calling, are among conservative of people and are not easily in However, the influence is just noticeable no doubt, be cumulative.

In the first place, the Sessions of the have permitted the establishment of perso tions between members of the staff of the ment of Fisheries and workers in other t This soon began to prove its value an various Sessions of the Council differen have attended, so that six of the total co of nine officers have now attended Sessio Council. These Sessions have been foll

al correspondence, largely on minor matters, amount to practical ' hints and tips ', although respect, where Malaya has been outgiving, atter has developed to major proportions. as been the distribution of the fry of *Tilapia bica* to all the territories and countries of the l, with the exceptions of Japan and Indonesia, cludes Australia and the United States. In anything, the Fisheries Department, Malaya, ven more than it has received at this demi- level and has had great pleasure and not a ride in being able to do so. As well as this ondence, we have welcomed visitors for periods, from all the territories and countries Council without exception. These visits ot in the form of official missions, but were d with Government approval at a demi- level. Perhaps they were the more enjoyable e of this.

e was one activity of FAO to which we were ced by the IPFC, which has proved of rable value. This was the attendance of es Officer, Mr. M. L. Parry at the powered boat conference in Paris. He gained in- ion of considerable value and made contacts ngine manufacturers which the Department putting to practical effect. Another five hould find the results of this widespread in lustry.

activities of the IPFC proper have proved ie. The Fish Culture Seminar arranged in hich was attended by the Assistant Director heries, Mr. Soong Min Kong. He gained seful information at this seminar and we are ng to see results in the pond culture industry aya, of some of the principles he learnt. He umber of experiments in hand to see to what other principles may be adapted to Malaya. these, are the rearing and breeding of *Puntius s.* This species was imported from Bogor, n established in experimental ponds and has mmenced breeding.

other activity, which is of specific value to the nent, was the Statistics Course held in k. Six members of the staff, four from the ion and two from Singapore attended. officers were of all grades and while the two enior officers found the course somewhat ary, the others gained considerably.

e the activities of the Governments of North Brunei and Sarawak are not so great as f Malaya in respect of the fishing industry, ector of Fisheries, Malaya, has passed on tion of value to those territories, as and esirable and applicable.

STATEMENT OF THE UNITED KINGDOM GOVERNMENT

(HONG KONG)

The IPFC came into being following the Fisheries conference convened by the Commissioner General for South East Asia in January, 1947. At that conference pressing problems of practical importance to the fisheries of the region were fully and frankly discussed and the need for an international organization concerned specifically with Indo-Pacific fisheries was freely acknowledged. At that conference the importance of fish as a major protein item in the diet of millions of people of the area was in the forefront of discussions, as was also the urgency of increasing supplies by scientific appraisal of resources and technological improvements in methods, gear and vessels. Stepping up the production of rice and fish rather than rice alone was, in the opinion of the conference, the way to improved nutrition. In this connection special emphasis was placed on pond culture of fish and the raising of suitable species in paddy fields under irrigation.

The British point of view was clearly expressed at this conference which included a representative of Hong Kong and domestic issues were more definitely defined at the unofficial conference of fisheries officers held in Singapore in September, 1948. The inaugural meeting of the IPFC was held at Baguio in the Philippines in February, 1948, and was attended by Dr. Herklots and Mr. S. Y. Lin as Hong Kong representatives. Since then sessions have been held in Singapore, Australia, India, Philippines and Thailand. Preparatory to the last Session in Thailand opportunity was taken during the 8th Pacific Science Congress at Manila to discuss the proposal to form an Oceanographic Institute associated with the IPFC. Hong Kong was represented at these sessions with the exception of the second and third and presented papers on two occasions.

The IPFC is a practical organization with activities directed to improvements in fish supply of the region and the stimulation of domestic policies concerned with fisheries developments of Member Governments. The nature of the organization is such that close cooperation in technical work is effected through the panels of enquiry set up by session resolutions and the Council maintains administrative continuity and co-ordinates development policy in the interests of the region as a whole.

It is difficult to assess the influence of IPFC on Hong Kong fisheries policy except to say that both my predecessor and I have taken very careful note of the views and opinions expressed by

workers of the region at IPFC Sessions. Our own policy is but two years old following the appointment of a fisheries officer who attended the IPFC Sessions in Manila in 1952. This does not mean that our policy was based on that of other territories but, as we were starting from scratch, the current views of other workers were very important to us. Above all we gained confidence in putting forward a policy based on the assessment of the local position and in keeping with the administrative and scientific appraisal of fisheries problems for the region as a whole.

The Council, therefore, has had a strong influence in devising and co-ordinating policies. It has acted as a clearing house for diverse views on fisheries matters. It has brought workers of the region together to the conference table to discuss practical problems of fisheries developments and ways and means of effecting such developments. It has allowed them to study on the spot the fishing industries, methods, gear, scientific services and problems of the host territory. This has led to clearer thinking and closer cooperation which, in my opinon, are the main benefits we have derived from association with IPFC. Workers of the region now know each other and are working along similar lines on common problems. Each region has its own peculiar difficulties but the information services of IPFC are bridging the gulf of isolation and keeping administrators informed of new developments.

It is true to say that the outlook of IPFC emerged more clearly at the last Session in Bangkok, and further, that the Council is now getting down to an approach which is acceptable to all territories. We cannot expect considerable improvements in the short period of the life of IPFC. I am certain it is working on sound lines and will ultimately exert considerable influence on fisheries policies and the extension and administration of the fisheries of the region.

It is also difficult to suggest lines along which the development of the Council's activities would be most beneficial. I believe that IPFC will do more for member countries by confining activities to its present policy of:

(1) Stimulating and encouraging member countries to carry out efficiently the programme best suited to the region concerned;

(2) Devising standards for efficient statistical enquiry and collecting, compiling and publishing reliable statistical data;

(3) Exchanging information on methods of production, marketing, processing and all matters concerned with fisheries and marine and fresh water fisheries

sion;

(4) Setting up panels of enquiry into of general concern to the reg whole;

(5) Inviting assistance of specialists region to co-operate on special as at (4);

(6) Confining activities to practical pro fisheries of the region and leavi meantime to the governments c the question of long range researc availability of existing fish stocks productivity of the sea.

Ultimately I believe that IPFC in its co-ordination of research programmes will with the need for the establishment of stations additional to those possessed by Governments. This will lead at a later da establishment of an Oceanographic Ins serve all territories. There is much yet to before governments will be interested in su developments and present policy should tricted to that of a bureau of fisheries inf for the Indo-Pacific region.

STATEMENT OF THE U.S.A. GOVERN

In reply to the request for a statement the influence of IPFC activities on the Fis the United States, the executive comm want to know that the direct influence o States fisheries has been very slight. This expected because most of the United States are located in continental United States, far removed from the area where the C active. There are, however, numerous which the Council has indirectly influe United States fisheries. Among these are development of information on the high fisheries and oceanography in the Weste area; and (2) valuable studies of fish methods and general principles which may able to more temperate waters.

With regard to the future course of the in view of the need of the member countr IPFC to increase production of protein f United States considers that the Counci activities will be most beneficial if it foste ches which will lead to increased protein duction as quickly as possible. Such should have priority over, but should not from consideration, basic research which increase in knowledge as the immediate ai

STATEMENT OF THE VIET NAM GOVERNMENT

avantages que la Viet Nam a retirés des
x accomplis par le C.I.P.P. peuvent être
és comme suit :

CIPP organisme de co-ordination.—Le C.I.P.P.
ue le centre de relations entre les pays mem-
t les organisations internationales telles que
UNESCO, WMO, et des pays membres
ix. Par l'intermediaire du C.I.P.P., les ser-
les Pêches du Viet Nam ont eu des contacts
, utiles et efficaces avec les services similaires
tre pays.

mple : Grâce au systéme des echanges inter-
aux d'alevirs (international fry exchange) le
des Pêches Continentales du Viet Nam a pu
ter de la Thailande le Tilapia, et de l'Indonésie
rpes de variétes puncten et sinyonya.

*CIPP—organisme de centralisation des infor-
et des travaux en matière de pêeche.*—Les
es de rensignements, de communications, et
blications dans le domaine de la pêche entre
fférents pays, par l'intermédiaire du CIPP,
rmis à certains d'amêliorer, leurs méthodes de
et en conséquence d'intensifier leur pro-
n. Cette confrontation de méthodes em-
s et des résultats acquis offre d'énormes
ges pratiques ; elle évite à plus d'un tech-
de perdre son temps sur un problème déjà
ailleurs.

ns, par exemple, la normalisation de la classi-
n des engins de pêche ; ce système est actuel-
employé au Viet Nam dans l'etude des engins

Pisciculture, la méthode d'élevage préconisée
Thailande s'est avérée beaucoup plus efficace
elle pratiquée ailleurs ; aussi le Viet Nam
adoptée.

*CIPP—instigateur des cours de perfection-
pour les techniciens de pêche—*

) *Pisciculture.*—Les techniciens vietnamiens au retour des stages de perfectionnement effectués en Indonésie et en Thailande, se sont mis immédiatement à propager, parmi les paysans, le procédé de reproduction des carpes utilisé en Indonesie et la méthode thailandaise d'élevage du Tilapia. Leurs efforts ont porté fruit : actuellement, il y a au Viet Nam une telle ruée vers les terres à vocation piscicole que le prix de ces terres ne cesse d'augmenter ; et le long des routes, on voit se creuser chaque jour de nouveaux étangs d'élevage. La devise, lancee par le Gouvernement en vue d'encourager la population rurale à se procurer un apport supplementaire de protéines animales : ' Que chaque famille ait son poulailler, sa porcherie, et son étang d'élevage ', se réalisera sans doute dans un proche avenir.

(*b*) *Statistiques.*—Au point de vue statistiques, la compilation des dossiers d'enquétes, étant en cours d'exécution, ne permet pas encore â nos agents d'en tirer des conclusions pratiques. Toutefoir, l'enssignement cucilli au Centre d'etude de Statistiques, organisé sous l'égide du CIPP, a été mis déjà en application.

(*c*) *Marketting.*—En matière de commercialisation des produits de la pêche (fish marketing), un premier essai d'application du système de Hong Kong est sur le point d'être effectué dans une province du Viet Nam.

En résumé, l'influence de CIPP sur les pays dont la Pêche est encore peu développée est tres appreciable.

Cependant, il serait souhaitable que le CIPP s'occupe davantage de ces pays leur apportant une aide technique en personnel et en matériel, afin qu'ils puissent augmenter leur productivité.

REPORT OF TECHNICAL COMMITTEE I TO THE 6TH SESSIO

Chairman : DR. N. K. PANIKKAR

0. INTRODUCTION

In accordance with the Resolution No. I adopted at the 5th Session, the work of Technical Committee I has been re-organized during the year into three panels (A. Inland Fisheries, B. Sea Fisheries, and C. Miscellaneous Fisheries including Hydrology, Plankton, etc.).

The interval between the 5th and 6th Sessions of the Council was utilized by the committee to review progress achieved in the various fields of work recommended for detailed examination by the Council at its 5th Session. Owing to various reasons the work of the committee did not progress beyond fact finding on topics referred to it, but a stage has been reached when ideas are developing on co-operative projects in certain fields. The preoccupation of members of the committee with their own national programmes, departure of members of the committee and especially panel chairmen owing to changes in their own individual assignments and absence of any progress in certain fields of study have all contributed to the somewhat slackness in pace at which Technical Committee I has been able to deal with the various problems. It is hoped that the Council at its sixth session will make an objective examination of how the work of the committee could be made more effective. The difficulties were partly dealt with in the report of the Technical Committee to the 5th Session. The point of view was expressed there that the increase in the number of sub-committees has probably reduced the effectiveness of work of Technical Committees. The interval between the 5th and 6th Sessions has shown that re-grouping in panels has not very much helped to advance the pace of work and, as indicated in the Assessment Report of the Executive Committee, there is even reason to think that grouping of subjects under panels, not infrequently results in neglect of aspects of study which otherwise might have been developed.

The committee notes with satisfaction the overall progress in scientific work in various fields of fisheries in the many countries represented on the Council. Substantial contributions to work falling within the scope of Technical Committee I have appeared in several new studies on the fishery biology of Indo-Pacific fishes. New serial publications devoted to fisheries have also appeared from the area.

1. COUNCIL RESOLUTIONS

1.1 *World Faunal Changes.*—Resolutio accepted by the Council at its 5th sessio Member Governments to give consideratio great changes that have occurred in faun butions throughout the world's seas, as major significance in relation to world fishe duction and requests Member Governm explore means by which evidence of suc changes and phenomena related thereto r fully documented. The replies received various Member Governments on this quest clearly indicated that, although the subject is ant, material for an assessment of such c not currently available. A paper on this ' Fisheries Research Methods of Gathering of Basic Changes in Marine Faunal Distribu A. R. Margetts, has been contributed by the ment of the United Kingdom. As reg countries of the Indo-Pacific, the major o that faunistic surveys so far carried out h so inadequate that even though changes mi been taking place, convincing information changes cannot now be brought forwa most essential requirement is to begin c data on an accepted pattern so that the ch any taking place, could be noted in futu Unless data have been gathered for several would probably be impossible to form co

Taking into account this resolution and that the question of fisheries production not receiving adequate attention by many countries, a suggestion has been made by the C of Technical Committee I to institute Ind Fishery Years at fixed intervals of time s least during these years data on fisheries p and ancillary information on oceanography biology and, if possible, faunal distributio be collected *at the same time* in the countri Indo-Pacific area. The project requires operation of all countries. While those having organizations to collect sea fisheries will find nothing new in this proposal, without adequate scientific and statistical could at least at fixed intervals of time co on a project of this type to collect data pert them. It was further suggested that the fi Pacific Fishery Year may be held in co with the International Geophysical Year,

fairly extensive oceanographic and meteo-
l observations are proposed to be made by
countries. The Executive Committee has
this subject on the Agenda of the 6th Session
the Council for discussion. If this proposal
pted, the Council would probably have taken
step in obtaining data for an over-all picture
eries production in the area in relation to
and oceanographic factors.

Water Pollution.—Resolution No. 3 accepted
Council drew attention of Member Govern-
to the information on this subject already
led and requested Member Governments to
ways and means for further study of actual
f damage which may be caused to fish popula-
y industrial or other pollution. It would
from the reports received that the importance
subject has been realized by member
es and that steps are being taken by some of
o protect the fishery resources (for details,
nd Fisheries Section). The major obstacle
study of pollution problems is that the
ation of specialists belonging to several
nes is required and the pollution problem
often very specific, requiring examination
ference to any one pollution problem at a
ar place. Even in such a study the problems
ods of approach and collection of standing
not seem to have reached any satisfactory
in most of the Indo-Pacific. The Technical
ttee would certainly like to consider this
n in greater detail than has been done.

River Basin Development.—Resolution No. 4
d by the Council drew the attention of
r Governments to the urgent need for con-
and exploiting the fishery resources asso-
with river basin projects by rectifying the
effects on the resources caused by dams and
bstructions through preventive, remedial and
ory measures and developing fish production
reservoirs and ancillary waters. The sub-
been brought to the notice of the Member
ments both by the actual resolution and by
sequent paper on the subject drawn up by
les and Dr. Job of the IPFC Secretariat.
are dealt with under the report of Inland
s Panel.

Rastrelliger.—Resolution No. 6 accepted by
ncil invited Member Governments to give
gent consideration to the problem of *Ras-*
fisheries and at the earliest possible oppor-
o nominate experienced workers to form an
Committee of the Sea Fisheries Panel in
al Committee I for designing an approp-
search programme. In pursuance of this
on nominations to the special Sub-Committee on *Rastrelliger* were received from the following Governments :

Ceylon—P. Canagaratnam
India—N. K. Panikkar
Indonesia—Amiruddin Nasution
Philippines—P. R. Manacop
Thailand—Tuanthai Bamrajarinpai
Viet Nam—Tran Ba Loc
U.K. (for Malaya)—D. W. Le Mare

The Malayan Government had very kindly extended an invitation to hold a meeting of this Sub-Committee in March 1955 at Penang, but as effective participation by the nominees could not be assured at this meeting, the session has had to be postponed. In the meantime the Council would further like to examine the problem of designing an effective co-operative programme of research on *Rastrelliger* and give such guidance as may be considered necessary to the Technical Committee I and the Sub-Committee.

1.5 *Age determination in Tropical Fishes.*—The Council directed that the Technical Committee I take whatever action is practicable to assemble information on current methods used in the age determination of fishes in tropical areas and on the basis of the information obtained to report to the Council at its sixth Session.

The methods used in age determination of fishes fall into two categories : (*a*) Length frequency studies, and (*b*) study of growth checks in scales, otoliths, vertebrae or other hard parts of fishes. The view has often been expressed that the utility of these methods in tropical waters is very limited owing to absence of sharply defined winters or summers which results in long spawning seasons and continuous growth. Recent studies have, however, shown that these methods can be employed with considerable success in working with tropical species as well, provided sufficient care is bestowed in the interpretation of results. Growth checks in scales and otoliths have been found in many tropical species, but it remains to be established how far they are strictly annual. During the early years of life of many species, length frequency studies have been found to be quite useful and reliable if sampling is adequate both as regards largeness of samples and freedom from selectivity of samples.

Age determination studies of several of the more important marine fishes were begun in 1952 by the Fisheries Research Unit of the University of Hong Kong and are still in progress. A preliminary note on the biology of *Nemipterus virgatus* (Houttyun) by Li Kwan Ming, appeared in the *Hong Kong University Fisheries Journal* No. 1, December 1954, and in this paper consideration was given to age deter-

mination with reference to the formation of ' breaks ' in scale formation occurring annually in this species.

A report is currently being prepared on an age determination study of the Wave Sea Bream, *Taius tumifrons* (Tanaka and Schlegel). An attack on the problem has been made by scale and length-frequency studies and by reference to the early growth rate of an allied fish *Paragyrops edita* Tanaka. It is concluded that ' breaks ' in scale formation occur annually and are probably the result of a winter decrease in growth rate. Peterson curves drawn from samples taken each month since October 1953 are for the most in accordance with estimates of age derived from scale studies. A comparison of the results obtained in Hong Kong and by Japanese investigators working on *Taius tumifrons* taken south of Japan and in the Yellow and East China Seas shows that, whereas there is general agreement in most cases as to the numerical values for body length appropriate to successive year classes, there is inconsistency of opinion as to the relationship between year class and age class. This work will be published in the *Hong Kong University Fisheries Journal*, No. 2, December 1955.

2. INLAND FISHERIES

2.1 *River Basin Development.*—With increasing industrialisation and consequent harnessing of waters for irrigation or power in many of the South and East Asian countries, the question of protection of fisheries in these waters is of paramount importance. Though occasionally regulation of waterflow may be beneficial to fisheries, any interference with the natural equilibrium of the planktonic and other life in the waters affects them adversely and it is extremely important that a country about to undertake such projects should learn from previous experience in that country itself or elsewhere. Some aspects of these problems are of a general nature and common to the region as a whole. Stress on this was, therefore, placed during the fifth Session of the Council, when it was also pointed out that instead of blindly adopting fish saving devices like fish-ladders (most of which have proved to be unsuited for the tropics), each water development project has to be assessed beforehand with reference to its possible effect on fish life.

In a paper on the status of fisheries in River Basin Development, Miles and Job (IPFC Occasional Paper, 1954) have pointed out that, though the impoundment of water above the dam, controlled irrigation and regulated flow of water etc. are favourable to fishes, the physical barriers to migration provided by the dams, fluctuations in the water level or the control of floods (which may affect those species which take advantage of floods for spawning), elimination of spawning and feeding changes in nutrients of water, pollution and to bottom by dredging etc. are all harmfu life. Of these the obstruction to migration haps the most important and though marked ' catadromous ' or ' anadromous ' fi the salmon are not common to South and Ea waters, yet long-range migrations with other than spawning are noticed in many, pre-spawning feeding excursions and so on. work, however, has to be done to investiga migrations fully.

The adoption of devices like fish ladder should be based on the individual require a dam. Besides these, protection should given to fishes congregating in the reservoi the dams, which otherwise would be ex exploited by the fishermen. In many plac have been converted into fish sanctuaries c fishing (e.g. Cauvery, Kistna, Godavari and bhadra rivers in India). Restoratory and mental measures like transplantation of bre fingerlings, extension of fish stocking to bodies of water opened up by the barrage (which incidentally assists anti-malarial effo the prevention of extensive fishing and o pollution should also receive attention in s grammes.

India.—The two major development present are the Damodar Valley Project Hirakud Dam Project. The Central Fisheries Station undertook extensive surv other related investigations on the existing conditions in the two rivers, the Mahan Damodar, prior to taking up the deve schemes. During a study of the fish and problems relating to the Hirakud Dam, Jol and Das [*Ind. J. Fisheries*, Vol. 2 (1)] inv the 15-mile stretch of the Mahanadi at the si dam and studied the major economically i fishes (approximately 24 species out of a total of 103) with special reference to the movements and breeding activities for cons of the fishery requirements to be provide dam. The majority of species were foun sub-mountainous in character and their migration short. Others, however, like th *Catla* and *Rohu*, were medium-range migr few long-range migrants present were of i ficant fishery value. As regards the spaw quirements of fishes the dam was found little obstruction to the spawning facilitie majority of species. However for the ' and such other migration that are as imp the spawning migrations, facilities have to vided. Fish ladders, etc. do not seem t

:e answer for this purpose. The power-vigation channel may be useful for fish to up to the reservoir. The mahseer sanc-at Huma and Meriapara and the associated :s would be eliminated after the completion lam by drying up or by flooding, though this prevented by directing sufficient water the left arm of the river there, which will :vent the fishery here from drying up. There the danger of the fishes accumulating grad-elow the dam and discharge region and get-ploited to depletion level and these waters therefore be 'closed' for fishing. It is also ed that the entrances to channels, turbine and siphons should be screened to prevent ting destroyed.

les these, the authors have also suggested emedial and restorative items such as utili-for fish culture of the increased stretches of d and semi-confined waters meant for irri-the reservoir itself sustaining a perennial he conversion of the larger pits from where as been removed to construct the dyke, into h ponds; fishery legislation limiting fishable retches, size of mesh, erection of traps etc. e construction of perennial pools in places the water dries up in non-monsoon season.

Damodar Valley Corporation has undertaken -organized fishery development scheme in ervoirs with major carps. The experience in Tilaiya Reservoir where the fish stock in 1952 has started yielding good results, cted to be advantageous in the other two irs at Maithon and Panchet Hill Dam.

The Madras Fisheries Department has been stocking Mettur Reservoir (on Cauvery) for the past many years with some of the major carps, and these are being exploited for the last five or six years on a commercial scale. The enforcement of rigid rules restricting mesh sizes of the drift and gill nets used, rescue of juveniles and their stocking in the reservoirs, prohibition of fishing below the dam are some of the factors responsible for this. The smaller reservoir at Bhavanisagar at the foot of the Nilgiris is now being similarly developed.

Similar experiments in stocking and exploitation are going on in Hyderabad State (at Osmansagar and Nizamsagar). In some reservoirs naturalisation of some of the major Gangetic carps stocked earlier is reported to have taken place.

Reservoirs in Uttar Pradesh, Madhya Pradesh and Vindhya Pradesh are also being stocked and the results are reported to be encouraging.

Japan.—Widespread industrialisation based on water resources has taken place in Japan, and it can be said without exaggeration that no river flows for any considerable distance without being obstructed by a dam. In the census taken in 1953 it was found that the total number of dams came up to 6,093 (*Vide* statement below), and many more have been added since then.

Many of the more important fishes in Japan are long range migrants, such as the anadromous *ayu* (*Plecoglossus altivelis*) and the catadromous eel (*Anguilla japonica*). So, all developmental schemes have been drawn up with stress on these fisheries. Devices for transportation of fishes are an essential part of all dams, and 10% of the dams in Japan are

Dams and Fish Ladders in Japan

Kind of Dam	Without fish ladder	With fish ladder
Power generation	550	355
Irrigation	3,171	225
Drinking water	18	14
Tide protection	6	-
Industry	45	6
Flood control	1,443	7
Lumber pool	24	-
Others	205	-
Total	5,462	631
Grand Total	6,093	

found to have fish ladders or fish ways or bucket carriers, etc. It cannot, however, be said that all these devices are as effective as intended, although a few are extremely effective carrying as much as 60% of the *ayu* population up the river.

Recent investigations on the failure of some of the devices have indicated the following reasons :

1. Most of the fish ways are designed by mechanical engineers who have no knowledge of fish biology. The devices therefore look fine and efficient, but are seldom made use of by the fish.

2. The available knowledge of the biology of fishes concerned is often far from complete.

3. The fish ladders are poorly handled by the laymen, who are not conservation-minded. ' Fish ladders ' are very often converted into ' Fishing ladders '.

4. Lack of proper planning and distribution of ladders. Sometimes one finds a fish ladder near a dam where no fish approach as a result of the construction of a newer dam further down, which, however, has no ladder to carry the fish over.

The failure of the ladders thus has necessitated in Japan the use of tank-trucks which collect the *ayu* fry and elvers from the estuary waters and transport them to the upper part of the rivers. Since this is more reliable than the fishway, both the fisherman and the scientist are now more interested in the methods of fry-fishing and its transportation rather than in the perfection of fishways.

Since diversion of water is an inevitable consequence of dams, the fact that the decreased size of the stream has correspondingly less capacity to support fish life has come in for much study. The need for prevention of fish from getting into the diverted channels has also been recognized. Screens, electric or mechanical, are being used for this, even though these have so far not shown entirely satisfactory results.

The use of fish-refuge-pools in rescuing these fishes was tested in the Veda Branch Station, Freshwater Fishery Research Laboratory (Kuronuma, K., and E. Okubo, ' Fish and Aquatic Insects Entering Water Diversion and an Experiment of Fish Refuge Pool ' *Bull. Fr. W. Fish. Res. Lab.*, 1955). A small pool was constructed along the diversion canal with narrow (intake and outlet) passages connecting two bodies of water so that the fish diverted into the channel are able to enter the pool. At least 30% of the fish diverted have at present been known to be rescued thus. This technique has the further merit that it is quite inexpensive and has no intricate mechanism.

The utilization of reservoirs for fish cu not as widespread in Japan as it should b fish production potential being considered less than that of natural expanses of wate natural fluctuation of water level, low fert water, and above all, in Japan the high turbi these waters with the consequent l of value as a biological medium are mainly sible for this. Individual instances of other c also exist. In one case the impounded wat sustaining a fishery for 4 to 5 years had ' barren ' and because of the undue propagand to this fact and the resultant cold-shoulde ment by the fishermen, the researchers did n the opportunity to study these waters. many cases before impounding, the areas wo be cleared of the trees, shrubs, etc. and ste remaining at the bottom of the lake would damage to the fishing nets used. The last i solved now by the use of echo sounder which a matter of seconds indicates the nature ground and even floating or drifting mat middle layers.

Investigations on the hydrological condit reservoirs have been undertaken in two Fisheries Stations—the work has been in p only for seven years. The hydrographical s Lake Sagami by T. Shiraishi and others nological Survey of Lake Sagami, a reservoi *Fr. W. Fish. Res. Lab.*, 1953) has given data siderable significance and further studies alon lines are in progress.

A fresh series of studies in Lake Hiraoka, th flood reservoir in river Tenryu, has been since September 1954 by Kuronuma in wh stead of a base-station, a house-boat (8.6 × equipped with ordinary lake survey appa used to carry four workers. Among the obtained are :

1. No stratification of water has been in the reservoir which is 8-36 m. deep may be due to constant moving of entire b water.

2. The turbidity of water indicated by electric cells is very irregular in its verti tribution, which is contrary to ordinary e tions.

3. The survey by use of the same instr show clearly the diffusion of clear tributar into the muddy reservoir water.

It has been tentatively concluded that the tu is the result more of silting than of any gro plankton.

The capacity of the body of water to sust life has not been reduced since impoun

in many cases it has been found to have in-

The two major species of fish, *Cyprinus* nd *Carassius auratus*, have shown relatively opulation density as judged from gill net as also have the two Cyprinids (*Zacco* and *Z. temmincki*). There is thus evidence dant natural food available in the water and a recommendation to introduce some species vorous fish to utilize these forage fish which erwise wasted. The rainbow trout seems tted for this, since the temperature con- of the reservoir are suitable for the trout

lack of shallow beds or aquatic plants in the r has also revealed some difficulties, as for , in the spawning of the wild gold fish. are now found to deposit eggs on floating ike wood-pieces or leaves or twigs. In the awning season any piece of wood left in the vernight was found to be densely deposited gs. This reveals the need of some 'fish- r egg catching material, and also points out of need for any fry catching or re-stocking ue for this species here.

iated with the study of Hiraoka reservoir, experiments are being done in connection kuma Dam project in the same river. The lge and experience are expected to influence ning of two more dams that are coming up Hiraoka reservoir within a couple of years. ne two big dams now present have no fish devices, this is a menace, since the river is ed for the population of *ayu* and eels, which v be stopped at the first dam. More atten- eing paid to this problem.

ish conservation problem is now being viewed ew light. Hitherto these problems were y monetary compensation being paid by the of the project (Government or private se) to the fishermen's co-operatives. Since es not solve the fundamental problem of ance of fish stocks, the compensation money eing used for 'facilities for maintaining fish ion' under which come hatcheries (for ater species like carps, eels etc. as well as for ter species like trouts), a fisheries station, hing gear and maintenance of tanks for *ayu* elvers, tank-trucks for transportation of fry, he amount also covers the running expenses for ten years.

pines.—A survey was conducted by a team g Mr. Marcelino Sabado of the Bureau eries in the northern part of Luzon Island ite of Ambuklao Hydro-Electric Dam and it nd that there was no fishery of importance at would be impaired by the construction of the dam. On the other hand the reservoir of the dam may present possibilities of improving the fish resources of the area, which may serve for stocking suitable species of fish and around which hatcheries, nurseries and pond projects may be established.

2.2 *Water Pollution.*—The problem of the pollution of streams and water ways by factory and other wastes and the consequent harm to the fisheries of these waters, was discussed during the Bangkok session of the IPFC and after a study of the material supplied by the various Member Governments in answer to a questionnaire issued, it was decided that work should be directed towards an investigation and assessment of the factors that govern such pollution. The following additional information has now been received.

Ceylon.—The extent of the damage to fisheries by water pollution is considered to be negligible since the country is not industrialised to any large extent. The only instance so far noticed was the discharge of spent wash from arrack distilleries into Dummara Madora Ela, a stream 31 miles south of Colombo (A detailed report of this is to be presented at the 6th Session). Occasional damages, however, have also been reported from Lake Beira in Colombo and Nanthikadel lagoon in Mullaitivu. But it is not definite if mortality in these cases is solely due to pollution.

India.—Investigations undertaken by the Central Inland Fisheries Research Station on the effect of factory effluents on fisheries of the Sone river, a tributary of the Ganga, at Dehri-on-Sone was completed. In the case relating to a paper and pulp mill on Sone it was found that mainly organic substances in the water effluents are responsible for the fish mortality by the depletion of oxygen. Mass destruction of fish was also noticed whenever the liquors were renewed in the digestors. A redeeming feature of the whole set-up, however, is that no pools are deep enough to hold fishes in summer, while in winter pollution is not felt so much, because of heavy rains and large flow of water. No conservational or remedial measures have been taken as yet.

Similar investigations are now being conducted in relation to a Sugar Mill on a tributary of the Ganga at Balarampur in Northern U.P. Results are awaited.

Sewage pollution in the tidal Kulti estuary, 24 miles from Calcutta, is also being investigated. The estuary collects all sullage from the city. The oxygen content in the water goes down as low as 0.6 p.p.m. Plankton in the estuary is insufficient except perhaps in January. Recovery processes are

almost nil, since the twenty-mile stretch remains a confined septic pool.

Japan.—With the rapid postwar development of industry in Japan the water pollution problems are acute as regards both sea water and fresh water. Citing the evidence collected by the Fisheries Agencies alone, fish damage by this cause amounted to 1 million yen in value in 1951 and 619 factories were found to be responsible for this (of which 26% were paper mills, 17% starch factories, 15% chemical plants and 13% wastage from mining). Pollution by discharge of sewage from cities and towns also contributed to this, but these factors could not be ascertained with the same degree of exactness as in factory effluents. Indeed the difficulty in pinning down the entire responsibility of fish damage to these has been the cause of much controversy between the fishermen and the management of the factories when it came to the question of compensation. The question is being settled now as follows :

> When a pollution arises and the cause of the damage clarified, the compensation money to be paid covers not merely the damage of fish but also for some devices (such as sedimentation pools) to prevent future damage of the sort. Recently an iron work company has been experimenting on a device to absorb the 'ill effect matter' from the effluents and this is expected to prove successful. Until such time, however, the compensation scheme seems ideal for protection of fish resources, though only a factory with large capital can satisfy the fishermen's claim.

Ordinances such as the Law of Fisheries Resources Protection, Law of Mining, Law of Rivers, Law of Public Welfare, etc. are intended to keep public waters clean and unpolluted, but these are seldom applied with enough rigidity to be effective.

The source of water pollution, however, is not merely from factory and other effluents. The popular use of many insecticides by farmers, such as D.D.T., Folidor, B.H.C., Parathion and the recently imported Dieldrin, Toxaphine, Aldrin, etc. which are sprayed in many fields are also said to cause immense harm to fish life. The recent questionnaire collected information on 41 such cases in fresh water and 48 in sea water. In view, however, of the labyrinthine character of irrigation channels, the accurate checking of this is extremely difficult.

The problem, however, is now being tackled at a scientific level and as a result the optimum requirements for the properties of water to keep the fish life normal are known. The so-called standard quality of water has been proposed on the basis of physical and chemical characteristics of water—organic factors (B.O.D., dissolved oxygen content and oil content), pH value, chemical factors (chloride, toxic metals, phenol and free chlorine), factors (transparency, colour, suspensoids, temperature, odour and taste) and bacteri factors. The standard water formula, defined by fishery scientists, has not ye wide implementation. It is, however, advertised and is expected to form the b the long-awaited Law of Water Pollution.

Meanwhile the Tokyo Aquicultural R Group has formed a sub-committee on wate tion with the aim of consolidating the resear gathered so far, and further accelerating wor The Government agencies are continuin efforts to come to an agreement among the and finance further research programmes to accurate, ample and applicable data, which pedite the Water Pollution Bill.

The Survey of a 100 km.-stretch of Sagar now taking place is of great significance in th The surveyors include 6 chemists and 4 bi besides experts on fishery science, sanitati creation, agriculture, power generation, and industries. The waters are now being diverse purposes besides irrigation, power ge and recreational fishing, and have not y polluted on account of the absence of any sig factory on it. A few small towns along it, h have their sewage emptied into it, but this caused any significant pollution. The however, is comprehensive and, besides chemical and seasonal biological studies also takes into consideration the topography, human habitation, forest formation, farming generation and scope of development of in in the area.

Pakistan.—No serious water pollution has arisen as yet, though the discharge of mill at Chittagong is feared to deplete the in course of time, if unchecked.

Philippines.—Progress along this line in Phi has previously been reported to the Fish Sub-Committee and no further significan has been done as the problem has no im bearing on the local fisheries, though some problems do arise from time to time.

2.3 *Stocking and Compatibility.*—The at its 5th Session considered the question compatibility of different species in fish and, since the work should necessarily be o term nature, decided that work should be co on optimum combination of compatible and their different size groups.

Hong Kong.—The area devoted to fish cu the New Territories, Hong Kong, excee acres, and is increasing annually. Most

consists of brackish-water ponds near the nd bordering the creeks which extend into ng mud flats. Investigations into fish culture g Kong are being concentrated on these ponds.

n species of fish are commonly reared together brackish-water ponds of the New Territories. include the Grey Mullet (*Mugil cephalus*), mmon Carp (*Cyprinus carpio*), four species of e carps—Big Head (*Aristichthys nobilis*), Carp (*Ctenopharyngodon idellus*), Mud Carp *ia molitorella*) and Silver Carp (*Hypophal-s molitrix*), and a Bream (*Parabramis pekinesis*). the Grey Mullet are caught when entering ater streams from the sea in the early months year and are stocked in the ponds in very umbers. The Common Carp is bred locally the other species are imported from China, they bred in the West River and its tributaries.

s well known that the long-established ue of culturing several species of Chinese ogether in the same pond allows very high tion levels to be attained. The introduction Grey Mullet into this combination has been aratively recent but highly successful experi-nd it is anticipated that an analysis of the methods of fish culture employed in the of the New Territories will from a basis for provement of local techniques and their ion to other areas of the Indo-Pacific region.

research programme undertaken by the es Research Unit of the University of Hong ncludes the following main lines of investiga-

Stocking densities of compatible species.
Growth rates and productivity, in relation atural and artificial feeding.
The environment provided by the ponds.
Parasitism and disease.

lementation of this programme, especially gard to items 1 and 2, has been hindered to xtent by the lack of reliable information, and h has of necessity been concentrated on items 4. A bi-weekly hydrological survey is made cted ponds and samples of plankton are also at regular intervals. 'A Preliminary Note Fresh-water Plankton of Hong Kong' by w was published in the *Hong Kong University s Journal*, No. 1, December 1954 in which ious 'blooms' of phytoplankton appearing vals in the ponds were described.

ise records of pond culture techniques can ined only when fully controlled experiments ssible. To this end several acres have been le by the Government of Hong Kong for ting up of an experimental inland fishery station. It is planned to construct ponds in the near future and it will then be possible to embark upon the complete programme of research into brackish-water fish culture outlines above.

It is clear that the responsibility of supplying the Indo-Pacific region with Carp fry rests at the present time with Hong Kong. The Chinese carps are extremely popular wherever they have been introduced and there is no doubt that their culture could be considerably increased and extended much further afield than at present. Two pre-requisites would appear to be essential in order that this can be achieved. Technically, there is a need for a simple and inexpensive method of bulk transport of fry by air and a series of experiments, at present incomplete, was begun in the summer of 1954 by the Fisheries Research Unit of the University of Hong Kong to determine the practicability of using polythene containers in which to transport the fy, under oxygen pressure and using various chemicals and drugs. Administratively, there is a need for a considerably improved liaison between actual and potential buyers and the fry exporters in Hong Kong, and in this respect the setting up of a Centralized Distribution Service, proposed through the I.P.F.C., would seem to be a major step towards the full exploitation of inland fisheries resources throughout the Indo-Pacific region.

North Borneo.—There were only four fish ponds in the Colony before 1948, used for carp culture. During the period between 1948 and 1952, 11 ponds were established and, apart from raising the Chinese Carps three additional species, Ikan Nile or Tilapia (*Tilapia mossambica*) and Sepat Siam (*Trichogaster pectoralis*) from Singapore, and the Kalui or Goramy (*Osphronemus goramy*) from Segama River were introduced by the Fisheries Department and adapted themselves well in the ponds.

The building of ponds in the interior areas was at first slow due to the fact that the cultivation of fish is a new sort of livelihood to the indigenous peoples. However, 62 new ponds were completed in 1953, many of which are considered too small for ordinary stocking of fish. However, in order to encourage them to venture into the new enterprise all the pond owners are supplied with fry.

With the exception of one pond in Sandakan, which is stocked with common carp (*Cyprinus carpio*); one other mixed with Tilapia, Big Head (*Aristichthys nobilis*) and Grass Carp (*Ctenopharyngodon idellus*); and 4 others mixed with Tilapia, Kalui and Sepat Siam for experimental purposes; the rest of the ponds are stocked with Tilapia.

The yield of Tilapia in the Colony in fresh-water ponds is not yet possible to determine, however,

yield in brackish-water ponds has been calculated within the range of 800-1200 lb. per acre per annum. The growth rate of this fish was found to be 130-140 mm. and about 83 gr. (3 oz.) on the average per year.

The culture of carps was established in Sandakan and Jesselton before the war, but no comprehensive data, so far, on their productivity and growth rate are available.

The growth rate of Big Head was reported on one occasion from a pond in Sandakan to be about 5 kg. per year.

The result of the culture of Kalui (*Osphronemus*) was found not very satisfactory, as the fish is a slow breeder. Considering the fact that the Kalui could be grown up to a rather large size, it may be advisable to rear it in small quantities together with Tilapia. The growth rate of Kalui in ponds is shown in the following table :

Age (month)	*Length (mm.)*	*Weight (gr.)*
3-4	56	-
6-8	105	-
16-18	150	-
26-28	300	-
34-38	305	1,200

India.—Experiments on the compatibility of the major carp fingerlings were in progress at the Central Inland Fisheries Sub-station at Cuttack for the past three years. Fifteen different combinations in 6 densities (from 1,000 to 6,000 acre) were tried. No artificial feeding nor manuring after stocking was resorted to. The work was wound up in April 1954 and the data are under critical study. A fresh series of experiments on similar lines, but with artificial feeding with oil cakes has been started since August 1954 and this is now in progress.

Further work on pond culture of fishes were also carried out at Cuttack and part of the results in the form of a paper was read before the 5th Session in connexion with the Plankton Symposium.

Studies on the compatibility of Tilapia fry with the fry of the major Indian carps were studied in 1954-55 when a 6-month period of experimentation was over. The results obtained are now being confirmed by further experiments.

Observations on the adaptability of *Tilapia mossambica* were made by Panikkar and Tampi (*Indian Journal of Fisheries*, Vo. I) along with studies on food and feeding, sex differentiation, breeding habits and larval stages of the fish. The fish was found to have remarkable adaptability to a wide range of salinities, and mortality was noticed only in cases of sudden transference from fresh water to water of high salt concentration. A gradual chang fresh water to sea water in three stages dui course of a week found all the fish healthy and of reproduction in the normal way. vegetable feeders under natural conditions, are seen to take to artificial diet in tanks and Thus the extreme adaptability to varying and to food, together with the rapid b and growth of these fishes, makes Tila ideal fish for culture in India in ponds as coastal lagoons. These authors have also the value of Tilapia as a forage fish and to the possibilities of using other species of for fish culture in preference to *Tilapia moss*

Utilization of rice fields for culture of is also being studied. Experiments on this now in progress at Narakkal and Ernaku South India.

The question of introduction of Tilapia t was discussed by the Fisheries Research Cor of the Government of India. After an exam of the various suggestions and results of res the Committee recommended as follows :

' In view of the fact that carp culture is organised in many parts of India, part in the Indo-Gangetic plain and in view possible adverse effects, which indiscr introduction of Tilapia may have on carp the Fisheries Research Committee set up Government of India in the Ministry of Agriculture resolves that :

(1) Tilapia may be introduced only i where scope for carp culture is and from where this fish may natural causes, spread to the ac areas ;

(2) for the present, Tilapia culture r taken up only in the following r

(*a*) in the western slopes of the W Ghats and the coastal strip b Cape Comorin and south c excluding river Tapti,

(*b*) in the districts of Tinnevelly, and Ramnad in Madras State s and including river Vaigai ;

(3) Tilapia should not be introduced closed basins, such as, Manip Kashmir Valleys ;

(4) Tilapia should not be introduced i parts of the country until the q has been reviewed after more scientific investigations and surve been carried out during the next three years ;

(5) all data collected in connexion w culture of Tilapia should be

available by the authorities concerned to the Secretary, Fisheries Research Committee ; and

) steps should be taken to eradicate Tilapia from areas in which it may have been introduced already, but which are included in clause (2) above, excepting in experimental centres approved by the Union Ministry of Food & Agriculture.

bodia.—Fish culture here is confined to the ; of Trey-pra (*Pangasius* spp.) and Trey-po *naudii*). But the Government have expressed villingness to participate in any joint scheme s the fry exchange, since the fry were delicate nited in supply and also because of the lack lified workers.

an.—Though no significant progress has been n the technique of fish culture in this country past two years, work along these lines is in ss in many institutions including the Veda Station of Fresh Water Fisheries Research tory (Nakamure, K., *et al.*, 'Fish Production in Farm Ponds in Shroda Plain, Nagano Prefec- th Reference to Natural Limnological Environ- nd Artificial Treatment', *Bull. Fr. W. Fish. ab.*, Vol. 3, No. 1, 1954). Here seven ponds .5 ha. surface area were studied as to fish tion with artificial manuring in some and in others. It was found by these authors e production and rate of growth of fish (es- y common carps), depend to a large extent size and number of fish at stocking, though finite relation between the two is not clear. y, the lower the density of fish, the greater wth. The total weight of the fish at stocking seem to have much effect on the final crop. lationship, however, would be at least partially adowed by the characteristic productivity pond. Also, the production of fish in a pond l with two or three kinds of carps, was found between 220-375 kg./ha., when no artificial es were taken and thus total productivity given pond seems to be invariable from year .

results of these experiments all conducted ratory level could not of course be applied as natural and confined waters where so many x biological factors come into play. They herefore to be investigated first.

ies on the compatibility of fishes have been n in Japan for long and it is quite a common e that the mullets (*M. cephalus*) are cultivated vith eels or common carps or even wild gold the same unit of field. However, laboratory aimed at a proper combination of compatible species have not borne fruit convincing enough in terms of applicability to actual practice. More critical study along these lines is needed.

Steps have also been taken of late to spread information regarding the use of rice fields for fish culture. A paper on 'Carp Culture in Rice Field as a Side Work of Japanese Farmers' is being presented at the 6th Session.

Malaya.—Culture of *Tilapia mossambica, Cyprinus carpio, Trichogaster pectoralis* and *Osphronemus goramy* is fairly widespread. *Puntius javanicus, Catla catla, Labeo rohita* and *Cirrhina mrigala* have of late been introduced with success.

Experiments in the monosexual culture of *Tilapia mossambica* were started in August, 1954 near Penang, with the co-operation of pond owners. Ponds approximately 40′ × 50′ × 2′ deep were stocked with 5-10 cm. male Tilapia and were harvested after four months when some of them attained a length of 23 cm., the majority being 19-20 cm. The ponds were heavily manured with organic manure from pigsties and the fish were not fed. The experiments are being continued in 1955, and will give an indication of what the Malay kampong type of ponds will yield when properly managed. Whilst the use of pig-manure would be abhorrent to the Malayans by reason of their religion, they could be persuaded to use cattle, goat and poultry manure.

Whilst the Chinese system of stocking a pond with the usual four varieties of Chinese carp is said to achieve the ideal in that the fish have complementary feeding habits and thus utilise all available food resources in a pond (both vegetable and animal), practical fish culturists in Malaya often meet with the presence in quantities of fresh-water shrimps in their ponds. These could obviously be profitably utilised by a predatory fish. *Oxyeleotris marmoratus* has been suggested as a suitable fish for this purpose, as it will breed in ponds and is highly prized for food, fetching twice the price of Chinese carp.

A consignment of Indian carp, consisting of three species, namely *Catla catla, Cirrhina mrigala* and *Labeo rohita*, was received from Calcutta in July 1953. The fish arrived by air in oxygen-filled four-gallon kerosene containers, and were first kept in a pond measuring 40′ × 40′ × 2′ and later released into a pond 50′ × 70′ × 3′. Both the *Catla catla* and the *Labeo rohita* have done well and their growth rate is certainly comparable to that of the Chinese carp.

A supply of *Puntius javanicus* and Si-nyonya was received from Indonesia in July 1953. These were first kept in a concrete tank 20′ × 20′ × 2′ and were later introduced into a pond 70′ × 50′ × 3′.

The fish were air-freighted from Bogor in jerry-cans partially filled with oxygen. The growth rates of these fish are being studied. *Puntius javanicus* is likely to prove popular to the Malayans as it is similar to their river-fish, the Lampan.

A slightly different form of culture has prospered over the past five years, that of cockle culture and many areas of foreshore are now under active cultivation, so that the markets are well supplied with this shellfish. The price has fallen from S.$35 per picul (133 lb.) five years ago to S.$5 per picul.

Philippines.—Studies on the stocking den
Chanos fish ponds are of early origin in the
The culture of this fish is done in areas
2,000 hectares and feeding is mainly with fila
green algae. Supplementing the food w
ficial feeding is rare and the ponds are of
shallowness to permit adequate and continu
for supporting a blanket growth of thes
Under these conditions the stocking inten
found to vary from 500 fish/ha. (1 fish/20 sq
to as much as 2,000 fish/ha. (1 fish/5 sq.
On an average 1000-1500 fish are being sto

Kind of stocking	Stocking Rate in No./ha.	Duration of culture to attain marketable size	
		Fertile ponds (50%-100% growth of algae)	Infertile ponds than 50% alg
Sparce ..	500-1,000	2-4 months	6-12 months
Medium stocking ..	1,000-1,500	3-8 months	8-12 months o
Dense stocking ..	1,500-2,000	6-12 months	over 12 months

No specific studies on compatibility of various species have been undertaken, but the combination culture of Chanos and *Penaeus monodon* has been found to be feasible and has become a regular feature in estuarine fish farms. The combination has been found to be advantageous both biologic economically. Chanos is a surface feeder *Penaeus* is a bottom grazer. Based on t periences a stocking scheme as shown b been drawn up.

Stocking rate for Chanos (per hectare) number	Stocking rate for *Penaeus monodon* in combination with Chanos stock (per hec		
	I class ponds (80-100% blanket growth of algae)	II class ponds (50-80% blanket growth of algae)	III class po (less than 50% growth of al
2,000	0	0	0*
1,900	600	0	0
1,800	1,200	0	0
1,700	1,800	0	0
1,600	2,400	0	0
1,500	3,000	0	0
1,400	3,600	800	0
1,300	4,200	1,600	0
1,200	4,800	2,400	0
1,100	5,400	3,200	0
1,000	6,000	4,000	0
900	6,600	4,800	1,400
800	7,200	5,600	2,800
700	7,800	6,400	4,200
600	8,400	7,200	5,600
500	9,000	8,000	7,000
0	10,000	9,000	8,000**

* Monoculture of Chanos only

** Monoculture of *Penaeus monodon* o

introduction of small but rapidly multiply-
eshwater fishes like *Trichogaster* spp. and
mossambica has presented a new problem
ercrowding of fish resulting in stunted
. The introduction of a carnivores of the
ind at the appropriate stage of growth and
proper management to balance these forage
and thus produce the right poundage of
urgently needed.

Introduction of predators.—The large-mouth
bass, *Huro salmoides* was introduced in the
ines by Alvin Seale in 1908 from Folsom,
nia. It was first stocked in Trinidad Lake
vicinity of Baguio City and in Bontoc,
ain Province in 1910. Baguio City has an
e of 5,000 feet above sea level with a normal
nperature at its mean maximum of 73.5°F.
mean minimum of 58. 9°F. Out of the same
were taken the fish that were stocked in the
am Park Lake in Baguio City, which has since
ecome the main source of all stock trans-
l in all other places in the Philippines. In
the fish was introduced in lower altitude in
vn of Los Banos, Laguna Province, which has
tude a little above sea level. In 1913, some
re planted in Lake Lanao in Mindanao which
altitude of about 700 meters above sea level.
5, another batch of the stock from Baguio
vas planted in the same lake. During the
ency of Dr. Herre as Chief of the Division
heries, some black bass were kept in an
nal pond in the compound of the former
1 of Science (now Institute of Science and
ology), Manila, which has an elevation of 3
above sea level. At the same time a few
ass were being maintained for display at the
Aquarium. The fish in the Bureau of
e compound were observed to be surviving
conditions in lower altitude, but no evidence
roduction was found. In 1927, fish from the
1 of Science pond were planted in one of the
lakes in San Pablo, Laguna Province, which
elevation of 96 meters. This was done to
hey would reproduce and multiply in a place
itly higher elevation than Manila. In August,
some fish from Baguio City were stocked in a
lake in Sabangan, Bontoc Province, which
elevation of 1,037 meters. No transplan-
of this fish has been made until lately when in
, 1952, 6 black bass surviving out of the 12
g from 100 mm. to 130 mm. taken from
am Park Lake were introduced in Manga-
Pangasinan Province, which has an elevation
meters. In May of the same year, 4 of the 6
ere caught and observed to have attained a
of 225 mm. to 261 mm., ranging in weight of
50 to 350 grams. No further follow-up has
ade of this batch.

At the moment, only those that were stocked in the Burnham Park Lake, Baguio City and Sabangan, Bontoc Province, are thriving and breeding.

Limnological survey of some of the Philippine lakes by Staff Members of the Division of Fish Culture and Fisheries Biology in 1954-55 confirmed the absence of black bass in areas of lower elevation originally stocked with these fish. No survey has yet been made of Lake Lanao. Observation and recent findings thus far show that black bass does not thrive and multiply in natural conditions at lower altitudes. However, in controlled ponds of lower altitudes they survive but do not reproduce.

Black bass were also introduced into a lake at Dalat (Viet Nam) without the knowledge of the fisheries service. Subsequent efforts in 1954 to locate the descendants of these introduced fish were unsuccessful.

Thailand.—Useful results have been obtained from some experiments conducted on 470 Tilapia (130 mature male, 130 mature female, 10 hatching female and 220 fingerlings) sent on 30th April 1955 to the Republic of Korea in response to a request of UNKRRA. After the long journey of nearly 36 hours, only one hatching female was found to be dead. Experiments on endurance and adaptability of the fingerlings (3-5 cm.) and mature fish (10-15 cm.) yielded the following results:

(*a*) 5 of each were put in a rectangular concrete tank, 2-3 meters, with 20 cm. of water. The following morning, with the temperature at 19°C, three fingerlings were found dead and the adults appeared sluggish.

(*b*) One hatching female was put in a glass case and 8 in a wooden tank and both enclosed by a glass house inside which the temperature was controlled and maintained at 22-25°C. (nearly 4 to 5°C above room temperature). The following day the eggs in the glass case were found to be hatched in greater numbers than in the wooden case.

(*c*) All the remaining fish were put into rectangular concrete tanks 5 × 9 m. with 60 cm. of water and a 20 cm. layer of mud at bottom. The tanks were enclosed by a glass house and both contained equal number of fishes. Temperature was maintained at 24-28°C. At night heat was supplied from a boiler for 4 to 5 hours.

(*d*) On the first morning they were fed with rice bran, the fish came to the surface to feed and appeared normal. On the third day the mature fish had turned purple indicating the desire for mating. Next

afternoon fishes were found with eggs in their mouth. Breeding experiments conducted out of doors (temperature ranging from 20 to 24°C) also indicated that spawning could take place under those conditions.

2.4 *International Fry Exchange.*—Consideration and discussion of an international fish fry exchange between countries of the Indo-Pacific region were held during the 4th and 5th Sessions and a questionnaire was issued to assess the need and resources of surpluses of fry in the various countries. Only 10 Member Governments replied. However, they were unanimous in agreeing on the need for such an exchange and that they would take an inventory of the available fish stock as well as potential demands, and arrange proper and economic distribution of the fry by negotiations with international airlines, shipping services and customs to facilitate safe and speedy transportation.

Cambodia.—The Government have expressed its unwillingness to join the fry exchange scheme since the fry of Trey-pra (*Pangasius* sp.) and Trey-po (*P. larnaudii*), the two prominent fish culti delicate and limited in supply and also becau lack of qualified workers for undertaking thi

Hong Kong.—Hong Kong has in 1953 nearly 22,000,000 fry of Chinese carps wh stitute the dominant culture fish. The sp *Ctenopharyngodon idellus, Hypophthalmichth trix, Aristichthys nobilis, Cirrhina molitorella* carps (*Mylopharyngodon piceus*) and bream *bramis pekinensis*) are imported. There is deal of entrepot fish seed trade in Hong Kon Chinese carps are imported from Canton an ted to Taiwan, after a part being retained use. There is trade also in the comm *Cyprinus carpio* bred locally, black c bream imported from Canton, and grey (*Mugil cephalus*) collected from local coasta

The figures given below are as accurate a obtained at the present time and give a fairly indication of the relative numbers of species of carps which are retained in Hong exported each year.

Species	Hong Kong	Taiwan	Singapore	Bankgok	T
Big Head ..	200,000	900,000	750,000	60,000	1,
Grass Carp ..	200,000	8,000,000	3,000,000	150,000	11,
Mud Carp ..	900,000	2,000,000	150,000	..	3,
Silver Carp ..	200,000	6,000,000	200,000	70,000	6,
Total ..	1,500,000	16,900,000	4,100,000	280,000	22,

The Chinese carps are extremely popular wherever they have been introduced and there is no doubt that their culture could be considerably increased and extended much further afield than at present. Two pre-requisites would appear to be essential in order that this can be achieved. Technically, there is a need for a simple and inexpensive method of bulk transport of fry by air and a series of experiments, at present incomplete, was begun in the summer of 1954 by the Fisheries Research Unit of the University of Hong Kong to determine the practicability of using polythene containers in which to transport the fry with oxygen and using various chemicals and drugs. Administratively, there is a need for a considerably improved liaison between actual and potential buyers and the fry exporters in Hong Kong, and in this respect the setting up of a Centralized Distribution Service, proposed through the IPFC, would seem to be a major step towards the full exploitation of inland fisheries resources throughout the Indo-Pacific region.

India.—Fry of the carps *Labeo rohita, C* and *Cirrhina mrigala* are offered in reasonab tities for exchange. About 1,000 each of s of the Chinese carps are needed from ou experimental purposes.

Indonesia.—A country well advanced culture, Indonesia has *Cyprinus carpio* (re and yellow), *Puntius javanicus, P. orphoide cheilus hasselti, Helostoma temmincki, Trichog toralis*, and *Osphronemus goramy*. Chin Indian carps are, however, needed to begin experiments.

Malaya.—The fry of *Tilapia mossamb Cyprinus carpio* in unlimited quantities and *gaster pectoralis* and *Osphronemus goramy* i numbers are available for exchange. Fry o and *Trichogaster* have been supplied in lar tities to Ceylon, West Africa, British Wes Israel, Honolulu, California, etc. The

from other countries are the Chinese carps, , *A. nobilis* and *H. molitrix*.

Borneo.—The country has little fish culture nt. Anyway the fry needed from outside *tius javanicus*, *Helostoma temmincki* and *carpio*.

pines.—Preliminary survey and assessment eed resources by Mr. G. J. Blanco of the f Fisheries showed that besides *Chanos* fry wing are available though seldom for export : *gus argus*, *Megalops cyprinoides*, *Elops is*, *Lates calcarifer*, *Anodontostoma chacunda*, p., *Glossogobius giurus*, *Choronophorus* spp., *melanosoma*, *Ophiocara aporos*, *Ryacichthys icyspterus* spp., *Epinephelus* sp., *Teuthis* sp., sp., *Penaeus monodon, etc.*

nd.—Tilapia fry are available in unlimited s for exchange. Among the species re- om outside are the fry of Chinese and Indian

sh Culture in Rice Fields.—Most countries of -Pacific area are interested in the question ulture in rice fields. Rice cultivation being revalent in the area, the use of fields for fish along with paddy or at times when there op, may prove to be an important contri- the food production in rice growing areas. ues of considerable practical application n developed in Japan, Indonesia and possibly untries. This is a subject on which the l Committee would like to bestow more and eventually a symposium on the sub- l be organized.

—Lantern slides showing the techniques h prepared and demonstrated at the meet- e International Rice Commission in Tokyo er 1954. Various reports on the subject sented at this meeting; these and other nd papers will be available at the 6th session ouncil.

Kong.—Work along this line has been con- three experimental localities and to one he common carp. Tilapia was unable to he whole winter in the shallow waters. ject, however, has not met with much at the hands of the average farmer for the reasons :

Individual holdings are small, often less than one acre ;

Under normal conditions water supply is barely adequate for rice culture. The provision of higher bunds is too costly for the peasant farmer. Also, without such high bunds fish will be lost during floods ;

3. The two rice crops, with 120 days for maturation of each, necessitates a holding pond for the fish for which the land cannot be sacrificed.

Under these conditions, the solution has been to concentrate pond culture alone and to expand the long established practices of carp culture and culture of grey mullets.

North Borneo.—The culture of Sepat Siam (*Tri hogaster pectoralis*) in rice fields has failed several times in the past years in Beluran (1950), Inanam (1951) and Keningau (1951). The failure was due to the inability to control the flow in the field, due to the primitive nature of the irrigation systems. Experiments are in progress in two fields, 200 and 50 acres in area.

India.—Some preliminary work has been done in Mysore on fish culture in rice fields. The results have been published (Iyengar, H. D. R., *Ind. Journ., Vet. Sci. & Animal Husbandry*, Vol. 23, 1953), but these results have only shown the further need for large-scale planned experiments. These are proposed to be carried out in Mysore, Tanjore and other parts of India. Experiments are already in progress for the improvement in prawn farming in paddy fields in Cochin ; the preliminary results obtained have been reported at the last session. Tilapia are also being tried for these experimental fields.

Philippines.—No systematic or planned experiments have been undertaken. However, being an agricultural country, Philippines has great potentialities in this aspect of fish culture. The total area now cultivated with rice which could be used for fish culture amounts to 516,000 ha. The recent import of Tilapia has given impetus to an exploratory investigation of unirrigated and rain-fed paddy fields by Mr. Tomas D. Sotelo, Fishery Officer in charge of Laong Provincial Fresh Water Propagation Ponds. The results are encouraging in that it was found that even in the absence of any irrigated fields some low-lying fields could be made use of and rain water impounded for duration of four to six months of the year. The experiments conducted in a field of 279 sq. meters (0.0279 ha.) had 4,000 fingerlings averaging 1.5 cm. in length and later 60 breeders. In 8 months 3,200 table-sized fish measuring 14.2 cm. long and 10,758 fingerlings of various sizes were produced, besides 3¼ cavans of rice. It is interesting to note that an adjacent field of area 450 sq. meters, not used for fish culture, yielded only 2¼ cavans of rice. More systematic experiments are being planned.

2.6 *Mullet Culture.*—The Grey Mullet, *Mugil cephalus*, is an important food fish widely distributed throughout tropical and semi-tropical regions of

the world, and in certain areas, notably in the Mediterranean, S.E. Australia, and along the Atlantic Coast of America, large fisheries are based upon it.

In Hong Kong, a method of culturing *M. cephalus* in the brackish-water ponds of the New Territories has been developed which in the last twenty-five years has been successfully imposed upon the traditional practice of carp culture which dates back for over 4,000 years. The extent of this success may be judged from the fact that *M. cephalus* is stocked in far greater number than any of the carps. Grey Mullet fry appear in thousands at the mouths of fresh-water streams in the early part of the year and are caught in lift nets and transferred immediately to the ponds. There the ecological demands of *M. cephalus* are such that there is little or no interference between it and the Chinese carps with which the ponds are also stocked, and very rapid growth of all species is possible.

The potentialities of the Grey Mullet as a pond fish in the Indo-Pacific region would appear to be very great. Not only may it become a significant source of animal protein in heavily populated areas, but it may also play a very important part in the reclamation and development of land at present mangrove swamp or salt marsh. In Hong Kong, the highly successful technique of culturing *M. cephalus* together with the Chinese Carp in brackish-water ponds, points the way in which it may contribute significantly to the food economy of any country where the fry are available. Before its full exploitation becomes possible, however, it is essential that our knowledge of many aspects of its biology, at present little understood, should be improved. This is especially true of its spawning habits and early developments, and it is towards a more complete understanding of its reproduction that enquiries in Hong Kong were begun in the spring of 1954 and are continuing. 'A Note on the Reproduction of the Grey Mullet, *Mugil cephalus* Linnaeus', by J. D. Bromhall, was published in the *Hong Kong University Fisheries Journal* No. 1, December 1954, and in this paper it was suggested that the Grey Mullet may be influenced in its precise spawning period either by the moon or by the tide or both. Research into the biology of *M. cephalus* in Hong Kong is continuing but it is clear that similar investigations will be necessary throughout the region of the Grey Mullet before a picture approaching completeness is obtained.

3. HILSA INVESTIGATIONS

The Hilsa Sub-Committee met at Calcutta from June 30 to July 4, 1955, and reviewed in detail the available information and recent researches on Hilsa in the Indo-Pacific region since the last s the Council. In this light the problems co the fishery at present were considered as nature of work to be organized in futu following were the significant points in cussion :

1. The need for further work on H stressed in view of the marked periodic flu in the fishery, of the widespread belief that t is getting depleted and of the lack of adequ ledge of the resources as also of obstacles tive management of the fishery.

2. Since Hilsa is common to India, Pak Burma and since this fish is a migratory sp possible inter-relationship between the Hi in the three countries should be studied. to be integration of scientific effort withou duplication.

3. Collection of biological information to the species, elucidation of the causes tuation in the fishery, and determination necessary, solution) of problems of depleti be the immediate aims of investigations. work on (*a*) morphometric comparison raphically and bionomically representative (*b*) study of migratory patterns with aid frequency data, tagging experiments, etc vestigation on the spawning stock, pattern o ment, availability of food, effect of salin perature, migrations, mortality as also asse fishing intensity, have been suggested.

Though a number of papers have been on Hilsa and its fisheries, only a few deal wi of direct significance to this programme.

Burma.—Research on Hilsa is practical initial stage. There is no statistical data though the fishery is indicated to be extens country, because of limitations in perso economy, was unable to actively participa implement research programmes. The ment, however, have promised all help member countries in conducting investig adjoining waters.

India.—A detailed study of the morpho Hilsa in River Hooghly was completed found that there are two runs of the fish in one ascending it in winter months and during the south-west monsoon. In vie wide disparity in sizes of these two, they ma be representatives of two different stocks. detailed study of the morphometric data, it has been found that the fish in Hoogh of a homogeneous stock, and the two runs not distinguishable by any meristic or no characters. From a comparative study o

Hooghly and Chilka Lake the morphometric cters that would be of help in distinguishing were selected. These were found to be :

tic characters :	No. of post-pelvic scutes, Total No. of vertebrae.
meristic racters :	Standard length, height of body, length of head, thickness of caudal peduncle, body thickness.

tudy on the normal variations in the morpho- l and physiological characters of the blood of was also conducted [*J. Asiat. Soc.* (*Science*), 1954].

dies on the biology of the stock were also under- The frequency distribution of ova showed distinct spawning seasons, one starting with onsoon and extending to November, the other from January to February. Also the fish several times during the season. From -frequency distribution it is seen that the ascending the river in winter months ose that have attained maturity for the first (about 1½ years old). The monsoon run is of age-groups, older groups predominating. ales mature at 16-17 cm. and females at 19-20 There is significant difference in growth-rate naximum length attained in the two sexes. is a predominance of males in the winter es, though the sexes are equal in the monsoon The former may be due to selective fishing. emales move in deeper waters beyond the reach surface nets.

d on observations on fishermen's catches, it cluded that Hilsa ascend rivers only for spawn- d the lower estuaries and coastal areas form the nent habitat of the fish. It is also suspected igration of the fish in the Gangetic Delta from y to February is influenced by rise in water ature.

stigations on food and feeding show this to plankton feeder. The spawners moving up- do not feed.

arches on Hilsa in Allahabad University have that the fish occur in Ganga River stretch llahabad throughout the year. This seems to t the view that the stocks at higher and lower of the river are separate. The Fisheries n of Damodar Valley Corporation found, the abnormal abundance of Hilsa in 1954, a herto unobserved fishery in a tributary of the at Gorakhpur. This extended migration is red to be due to pressure of population.

Statistics of Hilsa landings are available only from particular localities. These, however, are helpful in indicating the trend of the fisheries.

The investigations on the probable role of Hilsa in the maintenance of cholera endemicity, undertaken by the Indian Council of Medical Research, have shown that cholera vibrios as such are not found in guts of Hilsa. There is possibility, however, of cholera vibrios ingested by the fish turning non-virulent, but becoming virulent again under favourable conditions.

Pakistan.—Pending Government sanction for proposed schemes, little work could be done excepting some preliminary observations. Statistics on the export of the fish are available from certain parts of the country.

Future Work.—Under existing circumstances the investigations have to be pursued following a uniform methodology, subject to individual limitations in each country. To begin with, the sub-committee would attempt at the standardisation of methodology and working directives. When data accumulate in national centres in due course, a more active international programme may be required. The sub-committee recommended that appropriate means of organising and financing such an agency should be explored. The committee formulated a draft plan of co-operative research on Hilsa, taking into account the special situation in Burma.

Full set of papers relating to the sub-committee meeting on Hilsa including the draft plan of a co-operative research programme and a design of a sampling programme for the collection of catch statistics of Hilsa are appended to this report. The Technical Committee and the Council would no doubt like to examine the draft programmes and, with such modifications as may be necessary, recommend their acceptance.

4. CHANOS INVESTIGATIONS

During the two years of existence of the Chanos Sub-Committee, important strides have been made in the study of biology and culture of Chanos. Detailed accounts of the culture and techniques were obtained from Indonesia, Philippines and Taiwan. Researches on acclimatisation and related problems were made in India. The search for the fish fry in Thailand has now proved successful. Keen interest has thus been created in this fish in the member countries as also even in non-member countries within the geographical range of this species.

Spawning of Chanos under controlled conditions.—An interesting observation has recently been repor-

ted by H. Van Pel, Fisheries Officer, South Pacific Commission at Nonmea that the Milkfish can spawn in enclosed waters. This was observed for the first time in a salt water lake on a small island in Tonga Archipelago. The lake has no direct link with the sea, the salinity being kept up presumably by the porous nature of the soil through which the sea water seeps in. It is suggested that a detailed report on the subject be requested from Mr. Van Pel.

The finding is of great significance in Chanos culture, especially in view of the several fruitless attempts made in the past to induce Chanos spawn in confined waters. A tricky and often expensive aspect of all fish pond projects is the collection and transport in healthy condition of fish fry from coastal centres to the interior. The capacity of the fish to spawn in the pond itself thus removes a great impediment. The case, however, should be studied with caution and it should be established beyond all doubt that no remote or temporary connexion even exists between the lake and the sea at any time of the year. The hydrological and ecological features of the lake should be thoroughly studied as also the occurrence of spawners, their breeding habits and the season of appearance of the fry in the sea outside.

Rearing of Chanos in fresh water.—It has long been established that the Milkfish, by virtue of its wide adaptability to changes in water, is ideally suited as culture fish for the Indo-Pacific region. Further studies on the Milkfish in fresh water are now reported from many countries.

In the *Philippines*, where attempts on rearing the fish in fresh water have been sporadic but successful, the fish enjoys special popularity, some attributing a more delicate flavour to those grown in fresh water.

In *India* Chanos culture in fresh water is becoming increasingly popular. From results of researches at the Central Marine Fisheries Station in India, it would appear that Chanos may not be very successful in fresh waters which are deficient in calcium and chlorides. The latter are present in fresh waters near coastal areas, but not far inland. In some impounded waters in India (Mettur) and in some places in Java, Chanos culture has not been successful. Further field trials are necessary before these views can be finally accepted.

Now that Chanos culture has spread to many Asian countries and experiments on them are being variously conducted, it would be profitable to learn of the environment selected and experience gained. The more experienced countries may provide data on the following points :

(1) The requisites on the lay-out and construction of the fish ponds.

(2) The conditions necessary with regard soil, vegetation, fauna, physical and c characteristics of water.

(3) The nature of most easily available turable food for the fish.

(4) Nature and solution of the problem rally met with, such as the predators, gro unfavourable animals like *Cerithids*, *Gastropo* in ponds.

Report on new finding and contributions.- information on the occurrence of Chanos Indonesian waters is being reported (Saani ' On the Occurrence of Chanos Fry in Ind Waters ', Report to IPFC 6th Session).

The stocking densities of the Chanos fish in the Philippines are being reported for the fi The stocking rates range from 500 to 2,000 hectare of pond area. The conditions con this have also been described. Compatibl bination of Chanos and *Penaeus monodon* a ticed in the Philippines have been worked reported.

The preliminary survey of Chanos fry f the Philippines and the normal yearly product value of each is being completed. The grou widespread, and the peak of the fry season is year unlike as in Indonesia where two pe reported (Rabanal, H. R., Progress Report on Fisheries in the Philippines', IPFC 6th Sess

5. FOOD AND FEEDING OF FISH

The need for further detailed work on the f feeding of fishes was stressed during the 5th These studies in recent times have range simple analysis of stomach contents to t sideration of complexities of environments duce the feeding of fish and from simple c analysis of fish food to the physiological dem the fish. In spite of the importance of this few contributions of outstanding merit ha published. Work of general interest and ance has appeared in other countries among may be mentioned the paper by W. J. (' Outline for an Ecological Life History Stu Fish', *Ecology*, 36, 1, 1955) reviewing our kn of ecology of fishes of inland waters especiall U.S.A. and Canada.

Although the Council made special refer inland fishes, in the following account are cluded results of investigations on marine

India.—No special studies on the food a ing habits of the fishes have been undert

during the past two years, but information on has been gathered under general studies on the y of various fishes of commercial importance. tomach contents of the ribbon fish which con- s an important fishery along the south-east of India have been analysed by M. S. Prabhu *J. Fish.*, Vol. 2, No. 1, 1955), and found that the fish was a carnivore and there vide range in the items of food and the degree eding among the immature and spent fish. the immature individuals fed mainly on young s and clupeids without any seasonal variation, nature and spent fish fed voraciously, even to xtent of cannibalism (at a time when there was arth of other food). Individuals just prior to ing, however, showed a slackness of feeding. gh there is thus active and voracious feeding by sh after spawning in July to about February, tions are that there is some vague selectivity it, since some species were preferred to others, sh favouring small prawns, young *Anchoviella Leiognathus* spp.

e thread-fins (*Polydactylus indicus*) which form ificant fishery on the Bombay and Saurashtra have been the subject of study by K. H. med (*Ind. J. Fish.*, Vol. 2, No. 1, 1955) who his observations on the trawler catches landed mbay. The thread-fins were predominantly tory in habits. The crustaceans constitute the t item of food, especially in the juveniles; the fish showed a more pronounced piscivorous bottom or underwater shoaling fishes like *Harnehereus*, *Coilia dussumieria* and small sciaenids lvers forming favourite items.

machar and Seshappa (*Ind. Jour. Fish.*, Vol. 2, , 1955) in the course of their studies on the ar Sole found that the food consisted mainly of m organisms. Immediately after the south- monsoon, however, up to March when the s occurs at all levels in shaols, the fish also on planktonic polychaetes, sometimes to the sion of all other items. *Pronospia pinnata* was to be the most favoured single species of haetes. Next to polychaetes in significance amphipods (mainly *Cheiriphotis megachelis*) lamellibranchs (mainly species of *Pholas*, *la*, *Tellura*, *Arca* and *Cardium*). No star- was indicated during spawning time and no ence between the diet of male and female or of iles and adults. These studies on food and g of the soles, according to the authors, also some light on their migratory movements. bottom feeder it particularly favours poly- s during the post-monsoon months. With set of the south-west monsoon, however, the e sea bottom is highly agitated and most of the bottom fauna disperse. Then the soles move into deeper waters. In August or September, with the cessation of monsoon conditions, the mud settles and the polychaetes recolonise the bottom. The soles are now found to return to the inshore waters and form shoals. This is the main fishery season.

Japan.—In a study of the stomach contents of the carps Nakamura (*Bull. Jap. Soc. Sci. Fish.*, Vol. 21, No. 2, 1955) found that the common carp fry feed mainly on Chironomid and other insect larvae, while *Carassius auratus* feeds mostly on detritus; decaying planktonic green algae, copepods, daphnians and ostracods also constitute important items of food. The crucian carp, however, prefers organisms of smaller size. The difference in feeding habits, according to the author, is well reflected in the fact that the 'survival rate of crucian carp is always higher than that of carp and yearlings of the crucian carp grow faster than the others' and while there is unevenness in growth of carps in general, the crucian carps grow evenly.

Studies on the newly introduced snake-head have been undertaken by two biologists, Koizumi and Nishikawa ('Ecology of *Channa argus* Cantor with its Feeding Habits and Environmental Condition', *Rep. Gifu. University*, Gakinglibu, No. 2, 1954). The paper reports that the 2 mm. long fry feed on mostly plankton and later the fish eat carp and wild gold fish fry besides cyprinids, loach, shrimp, tadpole and aquatic insects. A fish of 25-35 mm. was found to take per day 5-10 fish of 10-15 mm. length, while fishes 250 mm. and larger consumed two or three 30-100 mm. fish. The fish feed most actively during the colder months, April (15°C) to October (13 to 14°C) and lies dormant in mud for the rest. The fish is found to need less oxygen and has greater haemoglobin content. It can withstand a wide range of pH values. The usefulness or harm of the fish has been summed up by the authors in that they are not to be introduced in waters where native fishes are propagating, and since they have greater powers of adaptation, they may be introduced to the somewhat polluted and unutilised waters.

The amount of food consumed by fish in unit time is important in fish cultural practice, but since most of the experiments on this are done in the laboratory the results can be applied to natural conditions only with caution. The methodology needed in tackling these problems has been set out in a paper on the food intake of *Sardinops melanosticta* by Yonida, Y. and Y. Yoshida (*Bull. Jap. Soc. Sci. Fish.*, Vol. 21, No. 2, 1955). Two species of phytoplankton—*Skeletonema costatum* and *Thalassionema nitzschioides*—which predominate in the stomach contents were chosen as food indicators and these were

counted in the stomach and intestine of samples taken at regular intervals. Interesting results have been obtained from this study.

Philippines.—Comparatively little work is being done along these lines in Philippines and most of what is undertaken comes as part of other investigations. The nature of food taken at different stages in the cultivation of Chanos is being studied by examination of stomach contents and these are later expected to be correlated to the availability of food in the ponds. This will be of help in planning their culture. Similar work is being carried on also for *Tilapia mossambica.*

6. SEA FISHERIES

1. *Neritic-pelagic Fisheries.*—Mr. E. H. Dahlgren, Chairman of the Panel on Sea Fisheries left the area in April 1955; this has resulted in lack of adequate contacts being maintained by the panel.

The Council at its 5th Session reviewed the data supplied by Member Governments in answer to the questionnaire and found that the composition of these fish stocks appeared similar in most of the countries of the Central Sector, the dominant group being *Clupeidae, Scombridae, Sciaenidae, Carangidae and Polynemidae.* The Council, however, confirmed the need to continue work in terms of the Resolution C. 52/24.3(8) and suggested that particular stress may be placed on discovering the extent of these fish stocks.

It was, however, felt that since numerous species came under this study and since the scientific personnel available to most of the member countries is somewhat limited, more definite results would be gained if work was limited to a few important fisheries alone. Special emphasis was placed on the Indo-Pacific mackerel comprising species of Rastrelliger which formed valuable fisheries in most of the member countries of the Central Sector. This did not, however, mean that other fisheries should be neglected.

2. *Sub-Committee on Rastrelliger.*—To promote co-operative research on Rastrelliger, a sub-committee was suggested, at the last Session and nominations were invited from Member Governments. Ceylon, India, Indonesia, Philippines, Thailand, United Kingdom and Viet Nam have nominated their representatives on the sub-committee. Countries like Australia and U.S.A. expressed their great interest in the venture though they were unable, on account of the distance of their countries, to participate in it and further they have no fisheries for Rastrelliger. Burma and Indonesia expressed their support but regretted that active technical personnel were not available to them for nomination, but Indonesia nominated an Observer to be pre the meeting of the committee.

A preliminary meeting of the sub-committ scheduled to be held at Penang in March 1954 kind invitation of the Malayan Government to a programme of research work on Rastrelliger difficulties were encountered by many M Governments in sending competent officers meeting and the attendance indicated was no cient to warrant a special meeting. The com is, therefore, yet to meet, but in the meanw tentative agenda for the meeting has been upon, which includes review of existing infor on Rastrelliger, its distribution of populations pilation of catch statistics, study of the grounds, fishing seasons, of migration, foo history and bionomics, besides studies on methods and gear, processing and marketing c ducts. The draft agenda would be a usefu for discussion prior to the designing of a re programme.

3. *Rastrelliger Fisheries.*—Much material ing to the mackerel fisheries has been collec the sub-committee on Neritic-Pelagic Fis during the former years based on replies recei the questionnaire issued after the 4th Session Council. A digest of this information is below:

India

Fishing grounds.—Within a belt of 10 along the west coast of India; minor fis on the east coast within 5 miles. The chief centres are on the west coast of India at giri, Malwan, Karwar, Malpe, Tellicherry, C and Cochin.

Methods of capture.—In the Konkan ar shore-seines, drift and cast nets operated at fathom depths. In North Kanara area by seine at 3 to 6 fathom depths. In South K shore-seine and drift and cast nets operate to 10 fathoms. In Malabar area by sein from dugout canoes at about 8 fathoms.

Fishing season.—The active season from O to February or March. Subsequently the break and disappear from Kanara and M waters. During the rainy season, a few mature mackerel are caught in inshore wa irregular intervals.

Migration.—Practically nothing is known movements of mackerel in the Arabian except perhaps that they appear early in the and follow a northerly course at the beginni the season and in a reverse direction at the

wning season.—From June to September. spawning is intermittent, extending over a ime.

earance of young stages.—Juvenile speci- 4 to 5 cm. long are commonly encountered ly-August. Early in 1955 (March) very stages of 2.5 cm. were recorded in the off Vizhingam in Travancore. Slightly specimens were recorded at Madras during er months—April-May (Rao & Basheruddin, *Sci.*, 1953).

t duration of fishery.—The mackerel fishery e of the oldest and has probably been in ion for centuries.

letion or increase in fisheries.—Owing to e appearance of mackerel shoals, there have fluctuations in the annual landings, but these never below the economic earnings of fisher- There are no indications of any positive e due to overfishing, but at intervals of two the fishery seems to reach its lowest ebb, tal landings in such years falling far below erage figures.

tes on marketing and utilisation.—As the sup- of ice are inadequate, only a fraction of the is sold fresh. The bulk of the landings is and sent to the interior or even exported to n. There are no organised wholesale or markets and very few fishermen's co- tives. There is no price control or facilities old-storage. The marketing conditions in al are unsatisfactory and call for the introduc- f better methods in handling. In the Bombay where fish carrier launches have been in- ced, distribution of mackerel is more effective. than 2,000 tons of fresh mackerel are trans- d from Kanara to Bombay annually. The by-product is manure, formed by drying the nd gills removed before curing. When there udden high mortality in impounded mackerel ntire stock is dried and converted into re.

rk now in progress.—Investigations on the erel have been greatly elaborated during the The Central Marine Fisheries Station has taken a detailed research scheme all along coast-line of India. The programme in- s: (1) statistics of mackerel landings; cial studies on the mackerel with special nce to the problem whether the mackerel on the east and west coasts belong to the population or to independent or semi-in- dent population; (3) survey of the extent e fisheries and search for the eggs and larvae e fish, particularly along the west coast; (4) study and survey of local mackerel fishery at the various centres.

Proposals for a preliminary tagging programme to study migration are also under examination.

Japan

The mackerel fishery here is constituted by *Pneumatophorus japonicus japonicus* and *P. japonicus tapeinocephalus*. There is no report of Rastrelliger.

Malaya

Fishing grounds.—Coastal waters to a distance of about 20 miles from shore.

Methods of capture.—By large lift net (pukat tangkul) operated in 15 to 25 fathoms waters. It is a 30 fathom square net made up so as to hang by its corners in a deep bowl. Progressively finer mesh is used towards the centre from $1\frac{1}{2}''$ to 3/8″ bar, with cotton two-ply twine of 20/6 and 20/8. The net is worked by five boats. *Rastrelliger* is also caught by the encircling gill net plied especially at night in 5 to 8 fathoms of water.

Fishing season.—The seasons are hard to deduce from the records of past years. Records have been imperfectly kept and further investigations must be done before conclusions are drawn about seasonal occurrence. The north-east monsoon hampers fishing from November to March.

Spawning, migration and appearance of young stages.—Have not been recorded systematically.

Past duration of fishery.—Uncertain, believed at least since the turn of the century.

Depletion or increase in fishery.—No indication of any decline in fishery from records available.

Notes on marketing and utilisation.—Usually sold fresh and is in great demand. Occasionally *Rastrelliger* is also boiled and sold. This practice is common on the west coast.

Netherlands New Guinea

Fishing grounds.—Humboldt Bay, Manokwari inlet and some inlets along the Geelvink Bay coast.

Methods of capture.—Fished with hook and line at depths of 20 to 40 meters. A purse seine has been designed by the Fisheries Section for experimental fishing.

Fishing season.—The fishing is carried out the year round if weather conditions permit. No specific information available.

Spawning, migration and appearance of young stages.—No information available.

Past duration of fishery.—At least 50 years.

Depletion or increase in fishery.—No specific data.

Notes on marketing and utilisation.—No information.

Philippines

Fishing grounds.—The coastal waters up to the 35 fathom line.

Methods of capture.—Purse seine (kubkub) operated from non-powered indigenous craft but towed by motor launch up to 34 fathoms. (*b*) Fish corrals (backlad) up to 10 fathoms. (*c*) Bag net (basnig) up to 35 fathoms. Operated by non-powered or powered indigenous craft with the aid of mantle and electric lights.

Fishing season.—Caught monthly all the year round.

Migration.—No study made.

Spawning season.—Studies are in progress. No conclusions have been arrived at.

Appearance of young stages.—Juveniles have been found in the monthly commercial hauls varying in different months and seasons of the year.

Past duration of the fishery.—As far as could be ascertained the fisheries have been in operation since 1920.

Depletion or increase in fishing.—In certain areas like the Visayan Sea and Malampaya Sound, there had been some marked fluctuations with a tendency towards decline in the overall catches.

Notes on marketing and utilisation.—Mostly sold in fresh state, sometimes dried and sometimes hot smoked.

Thailand

Fishing grounds.—East and west sides of the Gulf of Thailand about ½ to 3½ km. away from the shore for traps and 3½ km. or farther for seines.

Methods of capture.—By Poh or bamboo stake traps and seines. Vessels employed are mostly old sailing boats converted into motor vessels. Fishing is done at a depth of 6 to 10 meters for traps and above for moveable gear.

Fishing Season.—From October to March on the east coast and April to September on the west.

Migrations.—Probable directions are first from inner Gulf approaching the west coast and going up to the north to the inner part of the Gulf or down to the south and then back to its original source in the Gulf; or, secondly, from th Gulf approaching the east coast and bac Gulf.

Spawning season.—From February to both sides of the Gulf.

Appearance of young stages.—During A May.

Past duration of the fishery.—No recor

Depletion or increase in fishery.—There is decrease in the catch.

Notes on marketing and distribution.—F the fishing grounds are either brought nearby landing centres by motor vessels with insulated holds and then by rail t kok or by motor vessels from the fishing directly to the Central Market in Bangkok. ing at Bangkok the fish are sold by auct distributed to the markets. They ar salted and partly sold fresh; few are ' fish sauce '.

4. *Other Pelagic Fisheries :*

Australia.—Research into sea fisheries in for the past year has been directed to : (1) of a programme of long lining for dem rsa the edge of the continental shelf in S. A waters. (2) Study of the movements of A salmon *Arripis trutta* and the ruff *Arripis g* in S. Australia and W. Australia and the r tion cycles of these fishes; (3) Biometric of the trawl fishes of New South Wales; (4) of the flat-head and other trawl fish in fishery; (5) A study of the movement and biology of the principal estuarine and insho of Eastern S. W. Australia; (6) Analysis relating to biology of barracuda (*Thrysites* and (7) Study of the age and growth of t perch (*Lates calcarifer*).

Hong Kong.—The largest single fishery Kong is that based on five species of the Thread, and this group, in particular *N. virgatus*, the most abundant and economic portant species, has been investigated detail. A paper entitled ' An Account of the Thread Group Fishery in Hong Kong and minary Note on the Biology of *Nemipterus* (Houttyun) ' appeared in the *Hong Kong U Fisheries Journal*, No. 1, December 1954. same issue ' A Note on the Reproductio Grey Mullet *Mugil cephalus* Linnaeus ', Bromhall, described the efforts being made Kong to elucidate as much as possible of th of this species, which is of world-wide, a of local importance. Special emphasis

on its reproduction, spawning, embryology, rval development in Hong Kong, and in this theory was put forward, with some evidence port it, that the spawning periods of *M. is* are in some way influenced by the moon or les, or both. A second paper is currently prepared in which further progress will be ed.

earch on the Golden Thread continues but are now being concentrated on other marine s. The Wave Sea Bream (*Taius tumifrons*) en selected for study with particular reference determination and the results of investiga- to date will be published in the *Hong Kong rsity Fisheries Journal*, No 2. The Anchovies, *horus*, *Sardinella* and *Ilisha*, have been chosen ological studies in view of their importance e salt fish industry. Research will shortly ence into the fishery and biology of the Yellow er, *Pseudosciaena crocea* (Richardson). This igrates through Hong Kong waters seasonally, n the success or otherwise of the Croaker depends to a large extent that of the fishing s a whole. Special emphasis will be placed in udy on an investigation of the factors influenc- migration.

a.—Investigations on the oil sardines, *S. ps*, of the West Coast were continued by the tation of the Central Marine Fisheries Station licut. A comprehensive programme of work egional basis is under implementation. There very successful fishery for oil sardines in 1953- er a comparative failure of several years, but ly remedied partially as already reported to the il. The 1954-55 fishery has not been as good ne former year. An interesting correlation found the investigations at Calicut is that a successful rdine fishery is found to follow an intense ing of the diatom *Fragilaria oceanica*. The formation in this diatom has a four-yearly and it remains to be established whether the would show similar four-yearly trends (Nair ramanian, *Curr. Sci.*, 1955).

choodai fishery, composed of *Sardinella* and *S. gibbosa* on the south-east coast of was investigated by K. V. Sekharan (*Ind. J.* II (1), 1955). The fishery is for small sardines, O-year class, the proportion of older fishes catches being small. Shore-seines, hand-nets torches) and gill nets are the main type of gear *S. albella* and *S. gibbosa* spawn at about the f the first year of their life. A very interesting em is here raised as to whether the total yield increase if the catches of young ones are letely prohibited. These and related problems nder study.

The fishery for the ribbon fish, *Trichiurus* along the east and west coasts of India was investigated by M. S. Prabhu (*Ind. J. Fish.*, II (1), 1955). The fishery is composed of 2-4 year classes and has a restricted spawning period, June-July. The fish spawns only once a year and post-larvae 7-8 cm. long are found by the end of July. The species spawns first during its third year.

The biology and fishery of horse mackerels (*Carangidae*) of the west coast of India were studied by Chacko and Mathew (1955). These carangoid fishes (species of *Caranx*, *Decapterus*, etc.) constitute an important fishery on the west coast up to the 12-fathom line and occur all the year round. Boat-seines, drift-and cast-nets and lines are used for their capture. It is a more or less steady fishery accounting for an annual yield of one lakh of maunds.

Work has also been in progress in India on the percoid fisheries near Mandapam and on the Malabar Sole fishery on the West Coast of India. The results have been published in *Indian Journal of Fisheries*.

Among new aspects of work started in India, special mention may be made of the trawl fisheries between Bombay and Kathiawar where mechanized fishing operations have been in progress during the past few years. Studies are now specially directed to fishery biology and fishing grounds for the Dara (*Polydactylus indicus*), the Rawas (*Eleutheronema tatradactylum*) and the Ghol (*Sciaena diacanthus* and *Sciaena* spp.).

Results of the deep sea fishing operations of *S. T. Meena* have been published (Govt. of India, Ministry of Food & Agriculture publication, 1955).

6.5 *Oceanic Fisheries.*—The Indo-Pacific Fisheries Council at its fifth Session reviewed the work done on Tuna so far and suggested that work be continued on this with stress on (1) compilation of morphometric data, (2) tagging experiments and (3) exploratory fishing. Tuna fishing, however, is still far from advanced in many of the countries of the Indo-Pacific region, since they do not as yet possess facilities for oceanic fishing cruises. Enquiries addressed to member countries resulted in replies only from some of them. The situation is summarised below:

Australia.—Studies on the ecology of tunas have been proceeding slowly. Since February 1954 several oceanographic cruises have been made off South East Australia, but work has mainly been devoted to identify the water masses and movements of the blue fin tuna *Thunnus maccoyii* by D. L. Serventy.

Netherlands New Guinea.—No cruises were performed since *Hollandia*, the tuna exploratory

vessel was under repair. Some preliminary exploratory fishing for tuna did take place, but data are not sufficient for publication.

U.S.A.—Tagging of tunas by the California Department of Fish & Game to study the migrations and inter-relationships of the stock is expanding. 1,456 albacore were tagged and released off California in August-September 1954 and there is also an ambitious programme of tagging skipjack and yellowfin off Central and South America. Another study is being undertaken to correlate the occurrence of albacore to environments and its abundance in offshore waters. This is co-ordinated with the efforts of the Pacific Oceanic Fishery Investigations and the Oregon Fish Commission. Studies on the life history of tuna is also in progress, particularly as regards age and growth. The Oregon Fish Commission is also going ahead with research plans on the age and growth of tunas and is also sponsoring the analysis of oceanographical features of the west coast by the University of Washington.

The work of the Inter-American Tropical Tuna Commission has stressed importance on the collection and analysis of present and past catch statistics of yellowfin and skipjack off Central and South America. In addition, extensive studies are being carried on the life histories of bait species as well as on the yellowfin and skipjack. The relationship between changes in environment and changes in the population of these two tuna fish is also being investigated.

Four major projects are underway in the Pacific Oceanic Fishery Investigations. In three of these the techniques of oceanography, plankton study and fishery exploratory work are used in combination to discover the distribution and abundance of (1) yellowfin in equatorial waters, (2) skipjack resources in Hawaiian Islands and surrounding areas, (3) albacore stocks in Central North Pacific. The fourth is a project directed towards discovering a substitute for live bait to overcome limits imposed on the tuna fishery by the need for fish bait.

(1) The survey phase is almost complete. Yellowfin tuna concentrations in equatorial waters have been discovered and their distribution studied. Special attention is now being given to (a) improvement of longline fishing gear, (b) collection of time-series of oceanographic data in the equatorial current system for correlation with fluctuations in abundance of yellowfin tuna.

(2) Studies on skipjack population in the vicinity of Hawaiian Islands were continued with a view to increasing the catch of the local fishery by extending the short season and the now restricted area of fishing. Scouting expeditions during the past year indicate skipjack population to be wide-s with schools extending hundreds of miles b the range of local fishery. Also the 1954 c of Tuna in Hawaiian shore showed an increas the 1953 figures.

(3) Studies on the distribution and abunda albacore in relation to the transition zone be the north equatorial current and west wind were commenced in 1955.

(4) Research on artificial baits is being cont

Indonesia.—General notes on the taxo distribution and fisheries of Tuna and Tu fishes from Indonesian waters have been dra by J. R. Pattinasarany.

Hong Kong.—Oceanographical research in Kong is of very recent origin and was initia the Fisheries Research Unit of the Univers Hong Kong in March 1954 when the research t *F. R. V. Alister Hardy* began a series of m surveys of local waters. The sea area has divided into fifty-two stations by a four-m grid, and each month samples are taken fro surface, 10 metre and 20 metre levels and an in terms of temperature, chlorinity, dissolved o and pH value. In addition, surface plankto are taken at each station, and recently the analysis has been extended to include an estim phosphate content.

The present political situation is such detailed analysis of extra-territorial waters b research vessel is not possible. However, mercial vessels co-operate in taking weekly s samples across the Pearl River estuary, in th ing grounds between Hong Kong and Haina into the China Sea as far east as the Formosa The accumulation of such data should all assessment to be made of the influence of the River on local waters, and enable a picture drawn of the general condition of extra-ter waters of the China Sea.

The hydrological programme will short expanded to include an investigation of the graphy of the sea-bed and of the nature of b deposits. In addition, a project is at present consideration whereby it is hoped to be a compare the relative fertilities of different of water of distinct chemical and physical c teristics lying to the east and west of the Col

7. MISCELLANEOUS FISHERIES & GENERAL BIOLOGY

7.1 *Oceanography.*—In accordance with resolution adopted at the third Session of the requests have been made by the Secretariat

Member Governments to furnish the ture and salinity data relating to their waters. replies were received from many, the in- n available were extremely meagre, so the at the 5th Session recommended that s should be asked to publish such data vailable and apprise the Council of the exis- such publications. However, the majority ries in the region are not equipped for any raphic work, especially since work along this e of help to fisheries, should be done syste- y on surface and deeper waters.

nse from Member Governments as to the state of oceanographic and related work n far from encouraging and from what was the following points are indicated:

ılia.—Extensive and comprehensive hydro- ɔrogramme of the Division of Fisheries of I.R.O. is continuing. Many more volumes well known 'Oceanographic Station List' ɔeared in 1954-55.

a.—Little work has been done beyond ons for securing a fisheries research vessel services of an oceanographer from Japan.

a.—Hydrological data for the Wadge Bank g collected, but owing to lack of staff, general ɟical work for the waters around Ceylon be postponed. Steps, however, are now ıken to improve the situation and special ıve been called for the purchase of salino- etc. Temperature and salinity records, r available, are being kept.

—Oceanographic work done in India in ears has been summarised and reviewed by and Rao (*A.I.O.P. Proc.—Verb., No* 6). elpful assistance has been rendered by the Navy specially with *I.N.S. Investigator* ıve facilities to scientists going on board and g meterological and oceanographic data. of salinity at different depths have also ıt by the Marine Survey of India. A labora- physical oceanography has been established n. Studies on physical oceanography have n made by the Meteorological Department ıow has 26 Indian coastal observatories ing), by the Departments of Geophysics, and Zoology of the Andhra University extensive oceanographic programmes have dertaken with the aid of a mine-sweeper t their disposal by the Defence Ministry), Central Marine Fisheries Research Station ɣork relating to temperature and salinity ons are continuing. The Survey of India c Branch) is actively engaged in taking tidal ons. Besides these, general marine bio- logical studies are being carried out by the Central Marine Fisheries Station to obtain a clear picture of oceanographic conditions in relation to Fisheries. Aspects of marine biological work are also being handled by many other State Fishery Departments and Zoology Departments of various Universities.

Hydrological studies by the Central Marine Fisheries Station have been limited to inshore waters, pending arrival of a research vessel. But the assistance of Merchant Navy vessels have been enlisted to obtain a general picture of salinity and temperature distribution in the Bay of Bengal and Arabian Sea.

Investigating the waters of Gulf of Mannar and the Palk Bay at Mandapam, South India, Jayaraman (*Ind. J. Fish.*, Vol. I, 1954) found that the salinity shows a regular seasonal cycle corresponding to the south-west and north-east monsoons. The main salinity values for the year was 7.4 $^{\circ}/_{oo}$ in Gulf of Mannar and 9.0 $^{\circ}/_{oo}$ in Palk Bay. Highest values were obtained in May-October and the lowest between November and April, corresponding to the monsoons. This is explained by the fact that the south to north current during south-west monsoon brings in large amounts of 'oceanic' waters from the Indian Ocean and South Arabian Sea, which have high salinity (24.5 to 35 $^{\circ}/_{oo}$). In shallow waters there is further increase in salinity by evaporation. The maximum point of 35.6 to 37 $^{\circ}/_{oo}$ is obtained towards the end of September or early October. During north-east monsoon the northern waters (of low salinity) lowers the value up to 24.0 to 27 $^{\circ}/_{oo}$ until February when the strength of the influx ceases.

Surface measurements revealed a difference of only 1 $^{\circ}/_{oo}$ between surface and bottom salinity values. The dissolved oxygen content values are steady during most of the year (3.5 to 4.5 ml/l.) and surface bottom differences are not appreciable. The oxygen values are far below the saturation limits. Phosphate values were low, 0.15-0.30 mg.P/l. in Gulf of Mannar and 0.12 to 0.25 in Palk Bay and there was little seasonal fluctuation. Nitrates showed much wider variations, even to the extent of total absence occasionally. This may be partly due to the activity of denitrifying bacteria. Silicates showed the usual inverse relationship with salinity except in June-October in 1952, when this deviation was probably influenced by the swarming of *Noctiluca* then observed.

An integrated oceanographic programme on temperature, salinity, currents and plankton production was launched by the Andhra University, Waltair. The results have been published recently in *Andhra University Memoris on Oceanography*,

Vol. I. Based on these results La Fond has recently discussed the question of upwelling of waters on the East Coast of India (*Curr. Sci.*, 24, 1955). This programme is being continued.

Indonesia.—Hydrological work in Indonesia was confined to fresh-water lakes and marshes. Oceanographic researches on the Java Seas are being continued, but lack of personnel has resulted in the curtailment of programmes. Extensive surveys covering many lakes in Java, Sumatra and Bali and Celebes were carried out.

Malaya.—The construction of the Regional Marine Fisheries Research Institute is nearing completion. Future hydrological work will be carried out by this research unit. A research vessel *Manihine* is expected to arrive shortly from U.K. and work is expected to commence soon after this.

Philippines.—Compilation of temperature data was started in 1953, although unfortunately observations on salinity were neglected. Oceanographic observations were started at shore-based stations at strategic points, but due to lack of facilities these were often interrupted and incomplete. Oceanographic surveys are, however, now being carried on on board the Bureau of Fisheries Otter Trawler, *M. V. David Starr Jordan* where observations on temperature, salinity, nutrient salt contents, etc. of water samples are being recorded. Of the five areas surveyed in this way, Manila Bay has been the most comprehensively studied.

Whilst the difficulties faced by various Member Governments in this connexion are appreciated it is also clear that the present approach will not lead to the objective of preparing a complete atlas of temperature and salinity for the region. In view of the increasingly important role which physical, chemical and biological oceanography is assuming in fisheries exploitation, it is suggested that the Council should be apprised of the present unsatisfactory trend in respect of programmes of oceanographic investigations in the region as a whole and that the Council should be invited to give serious consideration at its 6th Session to the advisability of adopting a more practical approach to the problem, such as the establishment of a limited number of definite stations in member countries in the Indo-Pacific area or the establishment of an oceanographic institute.

7.2 *Plankton :*

India.—A comparative study of the plankton of the inshore waters of the Palk Bay and the Gulf of Mannar revealed that (1) during several months there was a relatively high standing crop in the Palk Bay, (2) the phytoplankton cycles showed differences and the total annual production was
the Palk Bay, (3) the total annual produ
zooplankton was greater in the Palk Bay
several months when the zooplankton was
the Gulf of Mannar, it was low in the Palk
vice versa, (4) differences in the distrib
copepods and chaetognaths have been noti
(5) the relationship between phyto-and-zo
ton and the hydrological conditions and the
has been discussed briefly.

Further studies on the marine inshore
were made at Mandapam, South India, b
(*Ind. Jour. Fish.*, Vol. I, 1954). The stanc
of plankton was of higher order in 1950 than
and the two peaks occurred in February-M
September-October. The phytoplankton
showed more than one mode; the peak in F
March, however, appeared to be the resu
bloom of a single species. In 1950 it wa
solenia alata and in 1951 *R. imbricata.* Th
June and August-November peaks were co
mainly by diatoms. The zooplankton has a
cycle, with a peak in February-April and a
October. It is interesting to note that v
vestigators at other coastal stations in In
reported a unimodal copepod cycle, here t
pods showed two modes. Observations on
eggs and larvae in the plankton show a di
relation between plankton level and abun
those species which feed directly on plankt

The structure, life history and ecology of
marina, gen. et sp. nov., a flagellate recorded
inshore waters at Calicut, have been studied
rahmanian (*Ind. J. Fish.*, I, 1954). The
occurs in swarms, at times causing a gr
colouration of the sea, often accompanied
scale mortality of fishes and other marine o

Studying the inshore plankton off Visakh
coast, Ganapati and Murti (*Ind. J. Fish.*
1955) observed two maxima in plankton pr
a preliminary one in 'spring' and a secon
in 'autumn'. The dinoflagellate maxim
found to be followed by the diatom peak,
turn was followed by the copepod peak.
maximum is considered to be the result of
of the nutrient-laden deeper waters, whe
secondary maximum is due to the influx
water. An interesting feature is the su
from the north to south, noticed in the bl
phytoplankton on east coast, as opposed t
ing on the west coast in a reverse direction.

Philippines.—Due to limited facilities
sonnel, not much has been accomplish
culture staff of Dagatdagatan Salt-water
mental Station at Malabon worked on seas

n of plankton in Dagatdagatan lagoon. The ire being published. Besides these, plankton in fish ponds and lagoons have been made by Rabanal and others, while the fluctuations in n of the estuarine waters of Navotas and n were studied by S. Bersamin. M. Abagon Bersamin have also studied the chlorophyl Kamit, Cavite.

Miscellaneous Fisheries :

Kong.—On the north-west coast of the New ies there is a very shallow bay occupying an about 30 sq. miles which nowhere exceeds 3 in depth and which is for the most part less e fathom deep. Hydrological and climatic ns are favourable for the growth and repro- of certain species of oysters, and one of he Pacific Oyster, *Ostrea gigas*, has been cul- ere for over 150 years.

quantity of oysters passing through the Hong arkets has been very much reduced follow- loss to China of the extensive beds along the Coast of Deep Bay, and together with this as been an increased demand for dried and oyster products from overseas. In the 53-1954 the total local production amounted t 14,000 piculs of shucked oysters (1 picul = . or 1.2 cwt.), valued at HK$1,400,000. To st be added the value of the shells, the weight h was approximately 126,000 piculs. These ld to the lime manufacturers at the rate of o for 140 piculs of shell, which amount after would produce 80 piculs of quicklime.

and overseas demands for fresh and dried and for oyster sauce, are such that production Deep Bay oyster beds is inadequate, and the ction and development of new culture tech- as well as research into the biology of *Ostrea* as been made a major project. The local of oyster culture is inefficient and lends it- ther to high productivity nor to research, ng as it does of scattering rocks and stones ea bed on which the spat settle and harvesting ure oysters by divers or with the use of tongs. scheme, in which the 'hanging drop' of oyster culture was employed, was launched pawning season of May and June 1954 and ess led to the initiation of an expanded pro- this year in which three separate areas of ay have been set aside for experimental pur- The proposed programme of investigation three main lines of research :

Experimental technology.
The biology of *Ostrea gigas*, including an investigation of its predators, parasites and disease.

(*c*) An analysis of the physical and chemical environment provided by Deep Bay.

In addition, exploratory surveys are being undertaken in the Colony with a view to extending the area in which oysters may be cultured. The object of this is not only to increase productivity generally, but also, where possible, to bring some measure of prosperity to areas at present impoverished. To these ends the possibility of introducing edible oysters from Japan is also being explored.

Hong Kong is relatively poor in marine algae. Seaweeds are found only along the exposed and rocky south and south-west coasts of Hong Kong Island and along the eastern coast of the New Territories, and their growing season is limited to a period extending from the end of November to the end of July, after which time they completely disappear from the shores. During the growing period seaweeds become locally abundant and are harvested for use as food, medicine and in industry, the most important genera being *Ulva*, *Porphyra*, *Sargassum*, and *Gloiopeltis*.

A review of the taxonomy of the marine algae of Hong Kong and a seasonal ecological survey of the most important genera and species have been initiated. It is hoped to publish the results of this work in three parts :

I. The Chlorophyceae
II. The Phaeophyceae
III. The Rhodophyceae

'Notes on the Marine Algae of Hong Kong : I. The Chlorophyceae' by B. T. Chiu has already appeared in the *Hong Kong University Fisheries Journal*, No. 1, December 1954.

At each suitable low spring tide from November to July, an ecological survey is being made along the south and south-west coasts of Hong Kong Island. The results so far obtained from these surveys indicate that all the marine algae are annuals, with the possible exception of *Sargassum* and species appear successively throughout the season, persisting in most cases for a period of one to three months. The manner in which such algae propagate is completely unknown.

India.—Studies on the bionomics and fishery of *Metapenaeus dobsoni* have been continued on the west coast, and the results published [Krishna Menon, *Ind. J. Fish.*, Vol. II (1), 1955]. From the size frequency studies it is found that males and females have differential growth rates, the male growing to about 70 mm. in the first year, 90-95 mm. in second year and about 110 mm. in the third year. while the female grows to 75 mm. in the first year, 100-105 mm. in the second and 120 mm. in the third,

Breeding period of the prawns along the Malabar coast is fairly long from September to March or April.

Work on various aspects of prawn fisheries of India is being reported at the Symposium.

Investigations on the Palk Bay squid, *Sepioteuthis arctipinnus* have been completed by Rao (*Ind. J. Fish.*, Vol. I, 1954). The squid supports a minor fishery around Mandapam. 1-, 2-, 3-year classes are found in the catches of males, while the females do not seem to live beyond the second year. The male attains maturity at 67.5-112.8 mm. when they are 6 to 14 months of age, and the female at 102.5 to 112.5 mm. between 12 and 14 months. The main food items are smaller fish and crustaceans, though cannibalism is common. Spawning commences in January and lasts till June. The eggs are always deposited in shallow inshore waters and lagoons. The fishery thus is regular and seasonal from February to June.

The wedge clam (*Donax cuneatus*) of Palk Bay was the subject of study by Nair and the results are being published (*Ind. J. Fish.*, Vol. II (2), 1955).

An unusual feature during the period was the revival of the pearl fishery in the Gulf of Mannar, for the first time since 1926-28. Systematic surveys conducted by the Madras Fisheries in 1954 showed the possibility of a fishery and a successful oyster fishery was conducted in the second quarter of 1955.

Further work is in progress in the Mollusc Research Unit of the Central Marine Fisheries Research Station at Madras on the growth of clams and oysters with special reference to optimal conditions for spawning and setting of spat.

Indonesia.—Systematic studies of prawn and shrimps are in progress and are reported to the symposium at the 6th Session.

Malaya.—Study of prawns and shrimps around Singapore is going on.

Pakistan.—Studies on the habits and habitats of prawns are in progress.

Philippines.—A comprehensive report of the crustacean and molluscan fisheries is being presented at the 6th Session. Studies on early life history and rate of growth of *Penaeus monodon* have been undertaken by Delmando and Rabanal and results are being reported to the Symposium. The blue-crab, *Neptunus pelagicus*, is being cultivated in brackish-water fish ponds (both experimental and private). The scheme originated accidentally since the early crab larvae, especially megalops, get into the po with the seaweeds (*Gracillaria*) which a duced as subsidiary food for Chanos. T larvae are now being collected on a large much the same way as the fry of Chanos or

The window pane shells (*Placuna plac* different species of oysters (*Ostrea malabo iredalei*, *O. palmipes* and *O. cucullata*) are widely. Specific studies on this, however as common as on others (' Kapis Farming i Bay' and ' Stick (Patusok) Method of Oyste in Dagatdagatan ' by G. J. Blanco).

Numerous fresh-water and marine mollu naturally without being cultivated and affo people a good source of livelihood. abound in bays or exposed beaches with muddy bottom, on reefs or any rocks in waters. Likewise exploitable fresh-water are found in all major river systems. T mum ' crops ' of these seem to be in the July-October.

The goby fry (ipon) fisheries of North Li north Mindano constitute an important se Philippine fishery, these fry and juvenil exploited generally as source of fish prote conservation of these, therefore, needs attention. A report on the assay of the g ipon fisheries of the Laog River and its marine shore, Ilocos Norte Province has j published by Blanco.

8. CONSERVATION OF LIVING RESOURCES OF THE SEA

The problem of conservation of fishe examined in great details at the United Technical Conference on the Conservatio Living Resources of the Sea, held at Rome May 1955. The problem of over-fishi excessive exploitation is of immediate co many areas where fishing operations ha extensively developed. The sea fisheries Indo-Pacific area are now in a stage requiri exploratory fishing and expansion. Howe danger of depletion does exist in a few Therefore it is of paramount importance fishery work should have in view this que safeguarding the stocks to obtain maxim tainable yield. For this it was suggested Conference that scientific information on the ing points are to be recorded in the various for the implementation of a fishery cons programme when the need arises.

1. Statistical records of the fishing eff fish landings in each country, along with b and ecological investigations in the area.

Information on the need or desirability of
itions on the amount, manner or kind of fishing
prove the quality and quantity of the catches,
if found necessary, the nature of measures to
opted.

Biological information on the extent and nature
h populations and investigations on the life
y, ecology, behaviour and population dynamics
e species constituting the fisheries, relation-
of the resources with other members of the
ecological community—all of which would be
ul in arriving at the nature of the specific con-
tion problems that may confront the individual
nations and the most suited measure that would solve it.

The full report of the Conference is an extremely valuable document. The Technical Committee I would no doubt like to study this report and recommend that scientific investigations carried out by the member countries might be oriented in accordance with the classified criteria adopted by the Rome Conference on types of scientific information required in a conservation programme and the types of conservation measures that might be applied. The relevant portions of the report are issued separately at the 6th Session of the Council.

REPORT OF THE TECHNICAL COMMITTEE II TO THE 6TH SESSI

Chairman : Dr. M. R. Qureshi

0. INTRODUCTION

It is gratifying to note that response from the members of the Panels was very good although some others failed to respond. The preparation of the Committee's report would be greatly expedited in the future if the members of Panels would submit their reports before the established deadline.

A general review is given of the various activities carried out in the region which indicates fairly considerable interest taken by different countries of the region in developing fisheries. The report has been based on the assignments decided upon at the 5th Session.

Detailed information may be found in the technical papers indicated under various items.

Progress during the year is summarised below :

It would have been the wish of Technical Committee II to have circulated this report to delegations in advance of the Session ; this has not however been possible owing to the lateness of receipt of some of the Panel reports.

I. CRAFT AND GEAR

Chairman—Mr. M. J. Lobell

At the 5th Council Session held in Bangkok in January–February, 1954, the following were declared to be the continuing assignments of the competent Panel over the next few years :

1. Introduction and appraisal of mechanized fishing methods for small, indigenous craft, including the respective merits of inboard and outboard engines.
2. Introduction and appraisal of non-indigenous gear.
3. Design of small fishing boats for the region.
4. Appraisal under fishing conditions of net and rope preservatives.
5. Use and effect of fishing with lights.
6. Use of indigenous materials for nets and gear.
7. Exploration for new shrimp resources.

The work performed in the territories of Member Governments on these aspects are given below, together with the critical appraisal and suggestions of the Committee, in so far as information has been forthcoming.

APPRAISAL OF MECHANIZATION FISHING FROM SMALL, INDIGENO CRAFT

The introduction of mechanical devices t vide greater efficiency in the fisheries is r steady progress within the Indo-Pacific region. basic means for employing such devices are and the possible benefits which may be d from mechanization are realized. But mech tion, which has been so successful in the w world, first requires solutions to a myriad of lems, many of which are unique to the Indo- region. Bitter experience has already show it is usually quite impossible to transplant equipment and techniques piecemeal fro part of the world to another in spite of the b success these might have had in the area they were developed. Almost always, chan varying magnitudes must be made to adap methods to local conditions. In the Indo- countries, basic data are often lacking to p guidance for technicians and administrators i ting a program of mechanization into action. too, governmental services are not well organi attack and solve the special problems arising. system of trial and error has many adva especially when well supervised by com technicians ; but such experiments are much likely of success if pains are taken to carry ou studies, even though limited, and to pro favourable atmosphere of conditions recept changes.

As a first requisite, as much as possible sho known of the type, abundance and availability fish populations to be utilized. Obviously, resources are limited to species which live in such as coral reefs, where mechanized ope are impossible, no attempt should be ma mechanize actual fishing operations. But, possibly, the use of engines for propulsion mi well justified to carry catches to market, to fishing operations at greater distance from p allow more time to be spent on the fishing g and to operate more units of catching effort. fish are sparse, economic considerations ap can catches support mechanization of fi Here again, the answer might be found in a m ship type of operation where power is used

small, unmechanized fishing units on appropgrounds and to transport catches to port.

eat deal can be learned from analysis of existhing materials and gear—oftentimes simple n modifying local methods give spectacular where attempts at introduction of entirely ethods fail.

n the characteristics of the resources are and the existing types of fishing analyzed, it be possible to make a preliminary decision whether or not mechanization is advisable; so, at what level; propulsion only, propulnd fishing, etc. At this point, competent concerning the adaptability of local-type craft gine installation should be sought. In some es, with practically no change in hull design ly minor adjustments in arrangement, it is e to obtain fairly adequate results with small . In other cases, design modification of rable extent may be required. Again, it e inadvisable or impossible to mechanize types of craft; and in such cases, expert s are required to develop designs which take nsideration local needs or even, to some local idiosyncrasies or wishes of the fisher- But the primary requisites of mechanization cases must be given priority.

type or characteristics of engines to be instalovered primarily by technical considerations weight, horsepower, size, type of fuel to be ase of operation, simplicity, servicing facilivailability of spare parts. Almost equally nt is initial cost, cost of operation, and upd potential usable life.

next logical step would be to construct a nt number of craft of approved design, install suitable for the work to be done, outfit e type of gear to be employed and design e parctical fishing tests to provide concrete on operating costs, catches, and income. perimental craft should be fished by regular onal fishermen. In order to obtain direct isons, fishing craft of the original indigenous ould be operated over the same period, in ie area, on the same species and preferably same fishermen. Such an experiment might up with 10 improved boats and ten original ft fishing the same type of gear in the same For this, 20 crews would be required. hould be interchanged from time to time in minimize the effects of differences in the professional skill. During the test period, hould cover a significant number of months tion, detailed figures of costs, running time, income and economic balances should be secured. The data collected should be sufficient to indicate if mechanization of the particular fishery is feasible. Naturally, due consideration must be given to many factors besides actual costs and income. Quite probably some sort of a chain reaction may be generated which involves handling, unloading, processing, marketing, transportation, and distribution problems. Oftentimes markets are so delicately adjusted that even small additional catches result in greatly depressed prices. For this reason the test must be very closely supervised by competent personnel.

If, after careful analysis, it is found advisable to stimulate large-scale mechanization, then definite steps must be taken to provide a suitable climate. Some sort of a directing organism must be set up to arrange, co-ordinate and supervise. Financing methods must be studied, credit facilities set up; depots for spare parts, shops for repair, stations for maintenance, training courses for fishermen, distribution points for fuel and other necessary adjuncts provided for. Inspection, keeping of records and control must be included. Technical services must be available to attack and solve accessory problems which may arise in marketing and use of the catches.

It cannot be over-emphasized that the original stages of project for mechanization must be carried out by an organization geared for this purpose-adequately staffed, intelligently directed, and well financed. While political considerations often must be considered, these cannot over-ride technical and economic facts—if they are allowed to do so, failure is sure to result. Sometime during the later stages it may be necessary, due to the magnitude of operations, for the original organization to relinquish some of its activities. These may be taken over in part by co-operatives, by credit institutions such as banks, or by private enterprise. Whatever these developments, ultimate supervision and guidance should be the responsibility of the fisheries service of the country.

Reports provided from several countries indicate that action in various degrees and at various levels is occurring.

Burma

It is reported that a program for mechanizing small fishing craft is included in an over-all fisheries development scheme. Both inboard and outbroad motors are being considered.

Pakistan

In this country a comprehensive plan appears to be taking shape and includes:

(*a*) A classification plan for fishing craft.

(*b*) Technical assistance from FAO in selecting the most appropriate lines, construction, etc. of fishing craft.
(*c*) A demonstration of five inboard engines for testing.
(*d*) A plan for following up results of successful tests.
(*e*) American aid in procuring fifteen engines of five and ten h.p.

India

Considerable progress is being made, particularly in Bombay. Here, a co-ordinated program encouraged by liberal subsidies—50% subsidy, 50% loan for three to five years—has resulted in an increase from nine motorized boats in 1950-51 to over 400 (late 1955).

In the State of Saurashtra, a beginning has been made and plans are under way to supply engines at subsidized prices to fishermen, 40 boats having so far been mechanized.

It was found in Madras State that local craft were largely unsuitable for mechanization. Designs were developed for suitable craft and the Department of Fisheries has built 12 vessels which are used for demonstrations to encourage fishermen to go ahead. Arrangements are being made to deliver these original craft to fishermen and fishermen's co-operative societies and to build additional ones.

Although mechanization for propulsion only has been considered previously, power is now being demonstrated for shooting and hauling gear in Madras State, under the guidance of an F.A.O. expert.

Under the Indo-U.S. Agreement for the promotion of the above programs of expansion and modernisation of marine fisheries, 367 marine diesel engines have been procured.

Hong Kong

By the end of March 1955 the power-driven fishing fleet in Hong Kong numbered 750 vessels. Of these about 719 junks were converted from sail to mechanical propulsion. This represents about 12% of the total number of junks engaged in fishing and probably about 50% of existing junks considered suitable for the installation of engines.

The 719 primitive types which have been mechanized comprise 161 trawlers, 230 liners, 253 purse seiners, 9 gill-netters and 66 collectors.

Commencing in 1950, developments were slow but steady; by 1952 the value of mechanization and the possibilities of it with junk-type fishing craft were clearly appreciated, so much so that in the 1953–54 season engines were installed in 402 craft, i.e., about 56% of the total number c mechanized since 1950.

The benefits under Hong Kong condit mechanization are :

(1) The range of fishing operations ar available for fishing are extended.

(2) Marketing can be planned wi minimum of interference to fishermen.

(3) More of the labour of the fisherm his family can be applied to the business of this is of considerable importance in im the economic position of a fishing com 90% of whom are owner-operators.

(4) Danger from bad weather and typh reduced.

The landings of fish at Government w markets have steadily increased since 1946 greatest increase has coincided with the pe active mechanization commencing in 1950. cative of the trend, the total fish landings in from 32,952 tons in the 1953–54 season to tons in the 1954–55 season. These increase ings are attributed to mechanization and part to :

(1) The addition of 19 motor deep-sea to the fleet.

(2) The greater number of mechanize in operation.

(3) The extended range and greater of mechanized native trawlers.

There is no doubt that the earning powe owner-operator fisherman has been greatly in by the change from sail to diesel pow propulsion and fishing. A detailed anal factors leading to increased landings is r difficult in the absence of prewar statistics an time must elapse before it is possible to dise the various factors that have contributed to in landings over the past five years.

A sampling analysis made by the M Department of 21 fishing vessels of variou before and after mechanization indicates t minimum increase in catch is twice and the m four times. Apart from these direct benef provision of large sums of money by both G ment and private enterprise for loans at lo of interest for mechanization has weaned the men from the traditional sources of loan mon crippling interest rates. Loan money is fe through the Fish Marketing Organization compels the fishermen to market throug Organization if he accepts cheap loan mone

re are 5,500 Outrigger Canoes or *orus* in Ceylon, with the exception of the Northern ce. They are fast, making up to 10 knots ood breeze, extremely seaworthy and can be or fishing with handlines, trolling lines, drift d live bait. It is doubtful whether the sailing s of the boats themselves can be improved; re ideal beach-landing craft, and the installa- engines, even if desirable, would be almost ible in the narrow dugout hulls. The gear is adequate for the purpose and could hardly proved upon. It would seem, therefore, hing from *orus* is not by any means inefficient at, although motorboats would have a decided age in calm weather seasons, a man who in a powered craft could use that money to in several *orus*. The only way to determine ative merits is to have powered boats fishing ide the indigenous craft.

re are two types of rafts in use in Ceylon, ger of which are known as the *katamaran* and proximately 25 ft. in length and consist of gs of lunuminella wood, pegged and lashed r to form a narrow raft. These boats, of here are some 1,250 in use, almost exclusively extreme north of the Island, are equipped with triangular sail and centreboard. They are ely seaworthy and, while rather slow, still e to move in the very lightest breeze. A uishing mark of the *katamaran* is the specially prow or 'beak' as the fishermen call it, gives increased sea-kindliness. These craft crew of two or three men and are used for etting in shallow waters.

e are also some 3,500 *theppams*. The *n* is a smaller edition (under 10) of the *ran*, which however rarely carries any form of The fisherman paddles out to sea during the nd drifts his nets in the early hours of the g. A more primitive form of water transport ardly be imagined. Slow and clumsy, they in time so waterlogged that each fisherman own two or even three, using one while the dry in the sun; in addition, only two nets can ied; hence there is an extremely low return ed with the time and effort involved. How- ny large-scale change-over from a long hed fishing method will be extremely slow, y on account of the tendency of fishermen to o their old established methods but also they may have a considerable amount of invested. If a light, economical, easily l type of small powered craft could be in- d to replace these rafts, not only would the power be greatly augmented by virtue of the extended fishing time and increased net carrying capacity, but the fishermen would also be saved great physical hardship.

In Jaffna, there is a small but thriving fishery using longlines. The boats used are open dugout canoes equipped with a removable outrigger. The men sail these to areas some 10 or 20 miles away. The boats perform well in a breeze but, as there are frequently long spells of calm weather, these craft often spend an excessively long time in travelling to and from the grounds. If they could be mechanized or a type of motorboat introduced to give independence of the weather, the catching power of this fishery could be greatly enhanced.

There is an important trap fishery in the Jaffna area, employing over 1,000 men and 200 boats. The traps are stake nets in shallow water which are frequently shifted and may be set as far as 20 miles away. If these boats could be motorized, the attendant increase in range and independence of the wind would give a similarly substantial increase in production. The Government is, with the assistance of an F.A.O. expert, making considerable progress in the mecchanization of the Jaffna boats.

Australia (Papua and New Guinea)

No attempts have been made to mechanize indigenous craft such as dugouts and *catamarans*.

Philippines

Although mechanization is proceeding in the Philippines, certain problems have arisen in this connection. Chiefly, mechanized propulsion is used to run to the fishing grounds and back to port.

Concern is expressed over possible loss of employment of many men if mechanization proceeds too rapidly. Financing is also an outstanding problem.

RELATIVE MERITS OF INBOARD AND OUTBOARD ENGINES

Very little factual information has been provided although it is known that outboard engines are widely employed in some parts of the Indo-Pacific region.

In *Pakistan*, experience with outboard engines indicates that 2 h.p. units are best suited for outrigger canoes, 4 h.p. for 25 foot Hora boats and 10-12 h.p. for 35 foot craft. The 4 h.p. engines are considered the most appropriate.

In the *Philippines* the industry is more inclined to the use of inboard engines because the nature of the fishing grounds is such that outboard motors are not usable, due to rough weather during a great part of the year. In addition, it has been found that

outboard engines do not hold up the arduous service; nor do they provide sufficient power for towing heavy nets. The only merits reported for outboard engines are greater simplicity in construction and greater ease in operating and repair. They are also lighter, more portable, and cheaper to acquire than most inboard engines. The cost of fuel and lubricating oil, on the other hand, is higher than for inboard oil engines.

In *Burma* experiments are planned to test the relative merits of inboard and outboard engines.

In *Australia* it is considered that outboard motors would be the logical choice for installation in dugout canoes with outriggers and for catamarans.

In *India* it has been found that inboard engines are most suitable since outboard motors break down under hard service conditions.

Hong Kong, with thousands of wooden junks packed tightly in narrow anchorages and shelters, has considered outboard petrol motors to be dangerous and their use on junk-type vessels has been prohibited. It is believed that this is a wise measure both in the interests of the fishermen and the fishing community. The mechanization drive has been with inboard water cooled diesel engines as being more suitable for junk-type fishing vessels. Engines range in h.p. from 5 upwards and are readily available in the local market. It is not possible to comment on this item from local experience but in general it is believed that the outboard motor is unsuitable for local conditions. It is likely that Hong Kong will continue to pursue a policy of mechanization with inboard diesels.

EVALUATION OF THE INTRODUCTION OF NON-INDIGENOUS FISHING METHODS

Since World War II, considerable activity has been apparent in the introduction of non-indigenous fishing methods in the Indo-Pacific countries. These introductions have been carried out by private enterprise independently, by private enterprise with government backing, by various inter-governmental technical and economic assistance organizations, and by other means.

Projects have varied greatly. In some instances complete vessels, crews, and fishing apparatus have been imported under various types of arrangements. In other cases, only vessels have been brought in. In other instances, fishing experts only. In still other projects, only fishing apparatus.

Because factual data is largely lacking, it is impossible to strike a balance of the results obtained from all of these widely-scattered initiatives.

General conclusions, however, can be draw such information as is available.

(*a*) While many enterprises have failed economic sense, valuable information has brought to light concerning the marine re and their potentialities.

(*b*) In many cases even though actual may have been successful, the project has because of other factors such as:

(i) Lack of handling, processing, and i ing facilities.

(ii) Even if these facilities exist, there is lack of demand for the new type of product, al it fills an apparent need for cheap, who animal protein.

(iii) Resistence on the part of the local fis to adopt new methods, or their inability to new equipment.

(iv) Often, it has been difficult, if not sible, to adequately train local fishermen to non-indigenous types of gear and vessels.

Because each case is different it is impo give any hard and fast rules for pro Certainly before any definite action is und some attempt should be made locally to ap all of the different factors that may influe proposed project.

Information received from the Philippin cates that three types of non-indigenous gear are now in regular use. These are p longline gear for tuna and tuna longlines, I drive-in nets and trawls (Japanese type bea and US-type, V-D otter trawls).

The adoption of these methods has resu the one hand, to a temporary general inc catches and stabilization of fish supply. other hand, due to characteristics of the r and uncontrolled fishing, there has been deterioration and depletion of the stocks levi (a direct effect of unregulated, intensive fis highly effective gear on stocks which are not of supporting this strain). It would be in to know, in cases of this sort, what level of s yield the resources could have supporte indigenous gear only used.

As an example of the cross currents that m up in connection with the introduction methods which may stabilize the supply, pointed out that stabilization adversely af income of investors in the extensive bango fish) industry. Previous to the introduction efficient appliances, the fresh fish market trolled entirely by the owners of bangos

inclement weather oftentimes bangos were
ily fish available for sale. With greater,
ed catches, it was no longer possible for pond
ors to control prices and markets.

the other hand, even though the fishpond
ors, fishcorral operators and fishermen using
ious methods were prejudiced economically
roduced methods, consumers, as a whole,
d greatly by having abundant fresh fish at all
s and at comparatively stable and reasonable

eport from *Burma* states that trawling was
uced in 1954 with very satisfactory catches.
Japanese trawlers, 280 and 100 *gross tons*
ively, are operating. It is noted that opera-
can be intensified profitably provided that
ailable market for sea fish can be improved.
operations are discussed by U Ba Kyaw in
cal Paper No. 25 presented at this Session.

Pakistan, the Central Fisheries Department
hi) reports that it is operating two non-
ious type fishing craft. One is 76 feet B.P.
ulled and powered with 150 BHP diesel (it is
s a trawler). The other is a 67 foot, wooden
refrigerated hold vessel, propelled by a 120
diesel engine and used for a variety of fishing
es.

wling experiments reported on indicate that
to 25 fathoms operations with this method
ot be profitable because the quality of the
fish is not acceptable to the consumers.

type cotton shrimp trawls of 100 foot and 70
mi-balloon trawls are being used. Some new
grounds have been found which are inacces-
o fishermen with indigenous equipment. It
cted that shrimp trawls of various sizes will
p new fields for commercial fishing, especially
ermen owning powered launches.

ndia, exploratory and experimental deep sea
operations with powered vessels are at present
conducted by the Government of India off
mbay-Saurashtra Coast and by the Govern-
f West Bengal in the Bay of Bengal. These
ons are aimed at assessing the suitability of
t kinds of fishing vessels, gear and methods
dian conditions, besides charting fishing
s in offshore waters and training personnel in
d fishing methods.

December, 1953 the two cutters of the Deep
ishing Station, Bombay, which had been
ed hitherto for Danish trawling, were con-
for bull trawling operations under Japanese
ians and yielded very encouraging results.
trawlers are now fully manned by Indian
personnel. The average catch of nearly 1,350 lb. of fish per hour of bull-trawling is about two and a half times that obtained by otter trawling. 'Mother-craft' fishing is being tried in Travancore-Cochin with some success. This involves the towing of a number of indigenous boats into offshore waters by means of a powerful tug or mother craft and after completion of fishing operations these being towed back. In addition, mother fishing vessels, Danish trawlers and Reekie boats are being employed in Madras, Bombay and West Bengal for experimental powered fishing. Three bull-trawlers have recently (middle of 1955) been supplied under the American Aid Programme for West Bengal and will commence fishing operations after the monsoons.

Under the Norwegian Aid, experiments on fishing with purse seines, drift-nets and lines etc. are being carried out from 30 ft. dories on the Travancore-Cochin coast. So far, purse-seiners have been found more efficient than other types of fishing gear. Experiments in connection with beaching of mechanised craft with the help of shore-winches are being continued. Nylon nets have become very popular as they are more durable and land much larger catches than the cotton nets. There is a great demand at present for nylon yarn. In Bombay State, hemp twine nets are also very popular.

Indian personnel are being trained in powered fishing methods on board the vessels of the Government of India and of West Bengal. Similar training is being given on the three schooners of the Norwegian Project in Travancore-Cochin.

Instruction in new techniques of fishing such as the use of flat trawl, shrimp trawl, nylon bottom nets, improved types of gill net and drift net is now part of a programme undertaken at Madras and Tellicherry under an F.A.O. expert. A centre to train Indian fishermen in the handling and maintenance of mechanized vessels has been inaugurated on the 9th August, 1955 at Satpati (Bombay) under the guidance of another F.A.O. expert. Two more centres in Tuticorin and Cochin will be established early in 1956.

In *Indonesia*, a fishery technician was made available by the U.S. foreign aid programme in July, 1953 in order to investigate the possibilities for tuna long-line fishing. Most of the difficulties listed here were experienced, and attempts are being made by the Government to overcome them. Although the original plan was to use one of the two American-built tuna clippers already in Indonesia, these did not become available for a variety of reasons and attempts were made to carry out longline operations from a smaller (27 meter) locally constructed vessel

which was not however available until October, 1954. Four longline hauling machines were then ordered.

In the first trial voyages, it became apparent that fishing operations could not be carried out with the available crew but a crew of Majang fishermen subsequently showed signs that they might fairly readily adopt the longline method. It is, however, estimated that a number of years must elapse before sufficient keen, trained personnel will become available for its general extension to the fisheries.

By this time, the lines originally imported at the commencement of the scheme had deteriorated to such an extent that they could be used only for float lines and further delay was incurred owing to the need to construct new gear from material air-freighted from Japan. Gaffs, spears and harpoons were fabricated from steel rod in the Fisheries Service machine shop.

Japanese records show that at least five areas in the Indonesian Archipelago show an abundant catch potential (from 11 to 30 fish per 100 hooks as against an overall average in the Japanese industry of 3 fish per 100 hooks). It therefore appears indubitable that there is a case for extending the Indonesian operations, provided the difficulties encountered can be overcome so as to carry out economically feasible fishing operations and so obtain a product which is sufficiently cheap to enter the local and export markets, and more especially to provide much needed animal protein in the inland areas.

Three later voyages of from 5 to 8 days each were accomplished on the fishing grounds with every indication of future proficiency, 6,280 kg., mainly of tuna and shark, having been obtained in 18 fishing days and sold in the Djakarta Fish Market for 26,485 rupiahs. Maximum catch was slightly more than 3 tons in four fishing days.

On the basis of the above experiments, it was considered that the construction of three additional vessels was justified and this is proceeding in the Djuana Shipyard in Central Java, taking into account the inadvisability of extending the operations faster than the ability of the local fishermen to learn and of the market to absorb the new product.

It will, however, be necessary to solve the problem of obtaining fishing equipment at present unavailable in Indonesia ; import restrictions and the limited Government fisheries budget makes foreign sources vague and hazardous and it will therefore become necessary for the Sea Fisheries Service to explore the possibility of fabricating their own major components.

It has also been recommended, in view of the difficulties encountered, and the necessity to encourage private operatives, that once it has been factorily demonstrated that economically pr operations are feasible, the Sea Fisheries withdraw from the operations in favor of enterprise, since only when boat owners and tives are working on a share basis can satis production be obtained.

In *Australia* non-indigenous gear is used commercial fisheries (diving for trochus she outrigger canoes is a possible exception).

Considerable activity is taking place in *Hong* A 30 foot mechanized junk, powered with H.P. diesel engine and with a power-operate winch, was built and is being operated as a stration, survey and training vessel. Plans model purse seiner have been under considera supply the need for more modern craft of thi

In *Thailand* work has been going on for years to introduce and test various kinds o indigenous fishing methods. The Japanese *ami* has been very successful, for it has many tages over the indigenous bamboo stake Adoption by local fisherman has been gradu principally to difficulties in financing a chang Large-scale experimentation with Japanese trawling gear indicates that certain possibilitie provided that various marketing problems overcome to utilize new species and ad quantities of market fish. Extended experi fishing with nylon gill nets at the Marine Fi Station near Rayong has proved so succes compared with the indigenous nets that local men are changing over rapidly. It is expect practically all gill nets used in Thailand will b in the course of a few years.

In *Hong Kong*, following the promoti mechanization of the local fishing fleet, the Fi Division of the Department of Agriculture, Fi & Forestry has succeeded in overcoming the tance of the Chinese fisherman to accept i digenous fishing methods and gear.

The old Chinese method of purse seining in the use of two sailing vessels. This was clum expensive and fishing operations depended on fine weather. Trials were carried out Fisheries Division using only one vessel satisfactory method was evolved and demon to fishermen. In purse seining with one mech vessel, the net is operated by one boat an sampans. During fishing one end of the net by a man on the sampan and the net is shot mechanized junk going at full speed to encir spot of the bright light sampan. When th meets the sampan the purse line is hauled in q This method has now been adopted by the m

hanized purse seiners resulting in the follow-
provements :

) A reduction in manpower. Nine persons are now able to operate the net where 12 were formerly needed.

) It is no longer necessary to tow the partner boat to the fishing grounds ; this not only reduced the speed of travelling but was also contrary to Marine Regulations.

In rough weather collisions between two boats are avoided.

A wider range of activity is possible as the mechanized boat is able to extend its fishing grounds.

The net can be shot and hauled in any direction and the position adjusted by propelling the boat ahead or astern.

The number of fishing units has increased as many fishermen have mechanized their partner boats which are now operated individually as single units. This has resulted in increased catches.

The cost of operations has been reduced, particularly in maintenance and crew's wages.

np beam trawls were originally designed for
on by small wind-driven vessels and the nets
ere small. With the introduction of mecha-
, the Fisheries Division set out to improve
gn of the net. Experiments up to the present
ve been largely devoted to replacing the old
mboo beam and stone sinkers with galvanized
oing and metal skates, and comparative tests
oth the native style and the improved gear
sulted in consistently higher catches with the
The advantages of the improved gear over
would appear to be as follows :

The increased weight and the arrangement of beam and skates ensures that the net tows efficiently, and the increased size of the net opening, from 14′ × 4″ in the old net to 14′ × 1′2″ in the improved net, has led to better catches.

Whereas the bamboo beam frequently breaks in rough weather, thus closing the net, the galvanized iron beam does not do so and this ensures that the net remains open for the entire tow.

anticipated that further development will
s towards increasing the length of the beam
difying the design of the net, and using nylon
of cotton. Experiments along these lines
inuing with a view to producing a larger and
ficient net, an aim now made possible by the
e mechanization of the shrimp fishing fleet.

DESIGN OF RECOMMENDED CRAFT FOR SMALL BOAT FISHERIES OF THE REGION

In *India*, an F.A.O. naval architect is engaged in evolving suitable designs for mechanized fishing craft for different sections of the Indian Coast. A few types have already been built for Madras, Saurashtra and Andhra and are now under trial.

A motor surf boat designed by the F.A.O. expert and built by the Madras Government is likely to become the prototype of an extremely useful fishing vessel which might revolutionize fishing from the hundreds of miles of surf-beaten coast of the States of Madras, Andhra, Travancore-Cochin and Orissa. There are some 21,000 *catamarans* along this coast which might eventually be replaced by the mechanized beach landing boats.

Madras State has, with similar FAO technical assistance, been constructing suitably designed mechanized boats and demonstrating their use to fishermen. These boats will be handed over to fishermen and fishermen's cooperative societies. A similar procedure is being adopted in Travancore-Cochin under the guidance of Norwegian experts.

No information has been received from other territories on the boat design programmes recommended by the Council.

APPRAISAL UNDER FISHING CONDITIONS OF NET AND ROPE PRESERVATIVES

Little work has been done this year on gear preservation methods and no reports on appraisal under fishing conditions have been received from Member Governments. It is suggested that the work of compiling into one document of the considerable information already available to the Council, together with an evaluation of the effectiveness of the various methods (many of which may be merely empirical) be allotted to a competent worker for presentation some time before the 7th Council Session. The present Committee has been unable to perform this task because the material is scattered and has not been communicated by the previous Committee, which stated, at the 4th Session, that a form for the simplification of the collection of data was under consideration.

The material available for this review paper is therefore as follows :

1. Material from five territories of which the collation was undertaken by Messrs. Martin and Datingaling at the 3rd Session.

2. Material from North Borneo, Australia, India, Indonesia and Singapore stated at the 4th Session to be in the hands of the Committee.

3. The papers listed in the bibliography on Gear Preservation presented at the 4th Session as *Technical Paper No.* 33.

4. Information from Australia, Cambodia, twelve Indian States, East and West Pakistan recorded in the Committee's report to the 5th Session.

5. Information from Indonesia contained in *Technical Paper No.* 23 presented at this Session, which however is descriptive and contains no appraisal of the methods under fishing conditions.

6. Other information, including that which may be obtained by correspondence at the personal level, and subsequent publications, including recent Japanese studies on the antisepsis of cotton yarns with protein sols, copper compounds and various polyvinil latexes (IPFC Occasional Paper 55/4).

PRACTICAL INVESTIGATIONS ON THE USE AND EFFECT OF FISHING WITH LIGHTS

Although some work has been done by Japanese authors on the physiological effect of light of different colors and luminosities, no reports have been received by the Committee on the practical application to the fisheries and the effect on populations, although two Japanese contributions by Mr. S. Takamaya and Dr. Z. Nakai are available at this Session as *Technical Papers Nos.* 27 *and* 28, and merely descriptive information on the use of lights in Indonesia is contained in *Technical Paper No.* 23 by the National IPFC Committee of Indonesia.

Bright light fishing in *Hong Kong* is standard practice with purse seiners but it is considered that surface illumination is wasteful and better results can be obtained by under-water illumination. The kerosene pressure lamp is commonly used for surface illumination and, apart from the cost of kerosene, maintenance costs of globes and mantles are heavy for the results achieved, particularly in windy weather. The Fisheries Division of the Department of Agriculture, Fisheries and Forestry, has been conducting experimental work over the past two years on bright light fishing and within recent months has concentrated more on under-water light fishing using electric lights. A simple and efficient underwater light has been tested and is being gradually introduced to purse seiner fishermen.

Should the Council desire to follow up this investigation it is suggested that Member Governments be requested to assign workers to carry out the necessary research work during the next period and that critical paper be prepared by a competent worker to be selected, on the basis of the forthcoming information and of a bibliography the compilation of which should form an integral part of the task, some time prior to the 7th Council Session.

INDIGENOUS VERSUS IMPORTED RIALS FOR CONSTRUCTION OF NET OTHER GEAR

The introduction of non-indigenous methods usually brings with it new materials more advanced countries for the construction and other gear. In most Indo-Pacific c foreign exchange is limited and it is often if not impossible, to continue large-scale i tion of gear construction materials. This b the question of substituting imported materi those of local manufacture. This often can l for many Indo-Pacific countries are produ various types of natural fibres—some have fa advanced plants for processing native fib twine and cordage. Tanning and preservin rials are very often available. Floats of ligh are usually available. Metal parts, such a rings and swivels can usually be made locally

There are several points to be considered often the most important feature of non-inc gear is its design and method of operation. cases it is probable that many local material used to reproduce the gear in question. the indigenous materials will not last as lon imported—they may be heavier and not as and the finished gear may not be quite as as the imported. But, as experience accu and local knowledge is applied, it is quite that local adaptations may finally be as goo not better, than imported gear.

In some cases, such as the use of syntheti the advantages lie more directly in the natur materials used. Here, substitutions are mo cult and perhaps impossible. Sometime possible to cut foreign exchange costs by im only the raw fibre, which is considerably than the finished twine, and spinning it loca any case, government finance authorities w well advised to consider the nett gain to economy before refusing import permits.

The report from *Pakistan* states that cot were used until nylon parachute cord becam able as surplus World War II material. Fi found that nylon lasted much longer than co caught more fish—much less care and mai was required and costs were lowered. kept by the Department of Fisheries show tha gill nets last six months as a maximum but nylon are usable for at least three years a catches average 10 to 15 percent greater nylon cord is not manufactured in Pakistan, be imported. This is being done to som with the assistance of the American Aid Pro

Madras, *India*, a similar situation exists with t to the use of nylon. Here, although nylon re more costly, fishermen are anxious to pro- nem. In Bombay, fishermen have been using ed hemp which was found to last better and more catching power than cotton. The tment of Fisheries helped fishermen societies ort hemp twine in substantial quantities and merican Aid Programme also provided a . Nylon has also been introduced and has found advantageous. Supplies have been ed under the American Aid Programme. In the price of both hemp twine and nylon is not rily within economic reach of fishermen. But v of the utility and durability of these mate- ishermen do not mind paying a little more than tton twine and local hemp twine. Demand lon is increasing day by day and this has un- edly increased the output of fish in the areas it is used.

letailed compilation of indigenous materials for fishing gear in *Indonesia* is recorded in *cal Paper No.* 23 presented at the 6th Session Indonesian IPFC Committee.

reported from *Burma* that imported materials construction of nets and gear have been found more durable and economical in the long run. uestion of foreign exchange, however, has yet solved. Ways and means to improve the and increase the output of locally-produced netting twines are being studied. Because also is in strong demand for twines for fishing ses, the Government of Burma is planning roduction on a large scale.

materials used in *Hong Kong* for the con- on of nets and other gear are imported. grass twine is the most popular material n net making. This is obtained from the *eria nivea* Gaud., a shrub 6 ft. in height which wild and is also cultivated in many provinces na. The dry fibre, which is said to be non- ent, is imported from Kwangsi and Kwang- n large bundles varying from 50 catties to 1 in weight. The fishermen make their own rom the dry material from which they make , or buy the finished thread from those who gaged in this occupation.

on netting is used mainly by purse seiner nen as the ready-made netting can be cut to quired size and joined together to make a seine in very little time. Immediately after r this netting was imported from Swatow but y large quantities have been imported from The price is low when compared with the ade nets of the local fishermen.

Nylon net from Japan has also been tried and found superior to cotton net but its use is not widespread as the price of nylon is high.

Nylon line imported from Germany and England is gradually replacing the old silk line as it is durable, flexible, strong, and transparent, and treatment is unnecessary. Fishermen claim that nylon line in the sea is not easily seen by fish, therefore catches are high.

Fishing hooks were formerly made in local shops. This trade has, however, ceased as the hand-made hooks were found unsatisfactory, irregular in size, blunt, and weak. The rate of production was slow and the price of the finished article high. Machine-made hooks are now imported in large quantities from Norway and Japan.

Stainless steel wire has replaced the copper wire once popularly used for the snoods in hairtail and conger-pike longlines. This wire is durable, does not rust and is never broken by the sharp teeth of the hairtail and conger-pike. Stainless steel wire is imported from America and Japan.

The use of indigenous and imported materials in fishing gear construction in the *Philippines* is discussed at length in *Technical Paper No.* 22 presented at this Session by Mr. A. F. Umali.

The use of synthetic fibre for fishing nets and rope in *Japan* is reported on by Mr. H. Miyamoto in *Technical Paper No.* 26.

EXPLORATION FOR NEW SHRIMP RESOURCES

No specific reports have come to hand from Member Governments regarding exploration for new shrimp resources, notwithstanding the interest in this subject expressed at the 5th Session, although it may be gathered from several of the contributions to the Symposium to be held in conjunction with the 6th Session, that Member Governments are conscious of the necessity to locate the adult prawns in deeper waters rather than continue to exploit only the juveniles.

II. FOOD TECHNOLOGY

Chairman—Mr. J. R. Vickery

The following report of the work of the Panel in the period 1954-55 has been compiled from information submitted by members in Australia, Ceylon, Indonesia, Malaya, India, Pakistan (West and East Pakistan), the Philippines and the United States of America.

It will be recalled that the panel's main task, agreed upon at the last Council Session, was a study

of improved methods for the production and storage of dried fish, with particular reference to methods suitable for wet, humid seasons of the year. Some progress has been made in surveying the methods of processing and storage used in a number of member countries, and also in defining the programme of investigations which should be undertaken in order to discover ways and means of producing dried fish of better initial quality and better keeping quality. Some research work is already in progress in three countries.

Representatives have been asked to consult their Government's about the part (if any) of the agreed programme which their countries are prepared to undertake. It is hoped that it will be possible, thereby, formally to launch this programme at the forthcoming Session of the Council at Tokyo. Several months elapsed after the last Council Session before the panel was properly organized and in the succeeding 9 months it has not been possible to advance the research programme much beyond the point of securing general agreement on the details.

In this report, the subject of dried fish is dealt with under the headings of current processing and storage methods, research work in progress, and proposed research work. A statement on the research programme follows. Brief statements on other fish preservation and processing research work are also appended.

A STUDY OF IMPROVED METHODS FOR THE PRODUCTION AND STORAGE OF DRIED FISH, WITH PARTICULAR REFERENCE TO METHODS SUITABLE FOR WET, HUMID SEASONS OF THE YEAR

1. Australia

(*a*) *Current processing & storage methods.*—The production of dried fish is negligible. There is a moderate production of smoked fish fillets from barracouta (*Thyrsites atun*) and mullet (*Mugil dobula*) using the traditional kiln smoking process. The process is, however, very mild and the weight losses of the fillets during processing seldom exceed 2 to 5 per cent.

(*b*) *Research work in progress.*—Nil.

(*c*) *Proposed research work.*—None.

2. Ceylon

(*a*) *Current processing and storage methods.*

Dried fish—limited to very small species such as prawns and sprats. The fish are dried on the hot sands of beaches in the dry zone.

Salt fish—dry cured—applied to all species fish are gutted, split and incised. Powdered rubbed into the incisions using approximatel salt. The exuding moisture is allowed to d for about 12 hours, the product washed in se and then dried in the sun for 3-5 days. It stored in a dry place. In certain areas, un fish (from large batches) are buried under one sand on the sea beach for up to 3 days while a processing. In all other cases, fresh fish i condition is used. The process depends on weather for sun-drying. Although the keeps for only about a month after curing, th better market for this than for wet cured fish.

Salt fish—wet cured—applied to all species. species are used ungutted, others are gutt scaled, if necessary. The fish are sliced and in barrels of saturated brine. The following tions in processing are practised:

(i) To the brine is added the dried peri goraka, *Garcinia cambogia*, in quantities usually about 2% of the 1 part to every 12-15 parts of salt. ingredient tones down the sharp t the salt in the cured product.

(ii) Instead of adding brine, salt (or sa goraka) is added to the fish and allo form a brine with the moisture in t

(iii) The first brine is removed after a few concentrated and returned to mixtu or more salt is added to keep th saturated during curing.

(iv) In dry weather, small fish may be re from the brine and sun dried duri day and returned to the brine for the The cure is usually completed drying.

(v) In most cases, sun drying is not em the fish being left in brine till co cured.

Wet curing takes about two to three weeks product can be stored in brine for two t months.

Maldive fish—made on a very small scale price of the local product is higher than that im from Maldive Islands, due to the higher init of raw material. Applied only to blood (tunnies) chiefly *Euthynnus pelamis* (Balaya) fish are gutted and sliced to give thick chun broth is prepared *either* by boiling *offal blo bones* in half diluted sea water (equal parts se and fresh water) *or* by boiling goraka in half sea water. The fish chunks are placed in the broth and boiled for ten minutes. The chu then removed and rolled in wood ash or c leaf ash, smoked for a few days and dried in t

rocess gives a hard cured product which is in emand as a seasoning in food and as an in- t in local sauces and savouries.

remarks

In all processes contact with metal is avoided as this spoils the product.

No scientific test of any nature is applied. Completion of cure is judged by appearance, smell and firmness to the touch. Decomposition and fitness for human consumption are judged similarly.

There are no standards as regards salt, moisture and sand content.

urrent research programme.—As the present methods depend on sun drying or the use of a ated ' pickle ' cure, an investigation has been to work out a simple salt curing process in- ent of the weather and use it to attempt the ion of fresh rough (unmarketable) fish of varieties into marketable cured fish in an o increase the amount of fish available for consumption.

ollowing is a report of the work done so far. terial chosen for experiments in curing was h only of a catfish, *Tachysurus* (*Netuna*) *us* (Ruppel), and brine curing was the tested. The strength required of the salt was determined by immersing pieces of brines of different salinity. The stable was one containing solid salt. Flesh in 50° brine decomposed in two days, 70° 13 days, 100° (saturated) brine in 20 days lesh in saturated brine with solid salt d stable for two months. In all solutions rated out on the surface slowly, and after a s, supported a fungoid growth which was d off. The entire solution was changed ally when the fungus could not be removed ely from the surface.

the flesh is immersed in brine, moisture in disperses into the brine and salt from the enetrates the flesh. To follow this process, for moisture and salt were done on flesh d in saturated brine containing solid salt. mmersion, moisture was 77%, salt negligible. o days, moisture was 55%, salt 21%. After the moisture was still about 55% and salt The ratio 55% moisture to 21% salt repre- 27% w/w salt solution in flesh which is a d solution. Hence within two days the salt ion is complete and the salt is in equilibrium rated solution in the flesh and in the outside A saturated solution in the flesh is possible h a brine containing solid salt.

When the salt saturated flesh was removed from the brine and exposed it lost moisture. A piece hung up inside the laboratory dried to 30% moisture while a piece dried artificially in an oven to 0% moisture regained 20% moisture on exposure. These are approximate figures as it was observed that the moisture content rose and fell when checked from time to time. These variations are now being related to humidity readings. The air dried sample had a thick outer crust of salt showing that most of the water had dried from the surface while the rapidly dried sample had only a fine surface deposit of salt possibly indicating that most of the water was removed as vapour from the entire piece.

The oil content of the flesh showed a decrease during processing. Fresh flesh contained 22% oil calculated on dry weight. After salt saturation the oil was 11% on dry weight and after prolonged air drying this came down to 4% on dry weight.

A piece of cured flesh was boiled in two changes of water (ten minutes each time) and tasted. There was no excess salt present and the product was palatable, though the texture of the flesh was fibrous.

Conclusions.—The experiments indicate that as regards the flesh of the catfish, a satisfactory cure is obtained by immersing the flesh in saturated brine containing solid salt for two days and hanging the flesh indoors to dry. The immersion is sufficient to preserve the flesh and the drying is merely to adjust to external conditions. This brine process is now to be applied to the complete catfish and then to other species.

(*c*) *Future research.*—A Government sponsored Fisheries By-products Factory is to be established in the near future. The new factory will produce salt fish using equipment and data supplied by Canada under the Colombo Plan. A technological laboratory will be attached to the factory to deal with research into by-products and dried fish.

Suggested lines of research.—For consideration by the proposed Technological laboratory :

(i) Test the use of air drying sheds.
(ii) Test the use of mechanical presses to remove moisture as a preliminary treatment (meal manufacture only).
(iii) Check ingredients used for cures namely, effect of salt impurities and active agent in goraka.
(iv) Investigate smoke curing methods.
(v) Investigate possibility of tests for completion of cure and fitness for human consumption.
(vi) Advise on standards for moisture, salt and foreign matter (sand) in cured products.

3. Federation of Malaya and Singapore

(*a*) *Current processing and storage methods*: Salt fish is prepared by both Malays and Chinese in Malaya and is eaten extensively by the Asian population. It is estimated that up to fifty per cent of the total fish landings in Malaya may go to salting establishments.

Native method of salting fish.—

Methods of dressing fish—In the case of small fish like tamban, selayang, kembong (temenong), selar kuning and other small selar, kikek and selangat, the gills and entrails were removed through one of the gill openings by a dexterous dig with a knife. If time permitted the tissue around the anus was removed by the incisions with the knife. This was done because very frequently in the process of evisceration the intestine snapped and the portion attached to the anus would be left inside the body cavity. The scales were not removed.

For small gelama, merah, kerapu, kachi, asoh asoh, and siakap (less than 6″ in length) the method of evisceration was the same, but in this case the scales were removed by scratching the surface of the fish by means of a scale remover in a direction from the caudal fin to the snout. The scale remover consisted of a flat piece of wood (6″ long, 1″ wide and ¼″ thick) with three to four nails (½ long) knocked through one end.

For big merah, gelama, kerapu, jenehak, kachi, asoh asoh, siakap, parang, chencharu, tenggiri, sagai, senangin, kurau and terubok, the fish was split into halves along the back from the snout along the dorsal fin to the caudal fin with the vertebrae sticking to one half. The gills and entrails were then removed. The scales might or might not be removed. In the case of the very big fish, the vertebrae and scales were also removed and the flesh split along the length of the fish at one inch intervals.

For bawal, daun bahru, debam and dengkis, the body cavity was opened by means of a slit cut from the anus to the mouth. The gills, entrails and scales were then removed.

In the case of duri the head was removed and the fish was split along the back. The vertebrae were then removed together with the entrails and the flesh scored at one inch intervals along the length of the fish.

In the case of yu the head was removed and the fish split along the stomach cavity. The entrails and vertebrae were then removed and the flesh split at one inch intervals along the length of the fish.

The above methods were generally used in dressing the fish. Individual fishermen, however, may use any method to suit their whim and convenience. For big fish, especially merah, kurau and ker fish might be opened up by slitting from t forward to the symphysis below the head gills and entrails were then removed fr opened body cavity and the fish salted by a s salting process. All the fish were rinsed v water before being treated with salt.

Salting process.—The dressed fish were ther in wooden tubs or concrete tanks which mig tain some brine left over from the previous process in the case of the cheaper varieties. salt was put in according to requirements, about ten per cent of the weight of the wet fis be sufficient. For big valuable fish like they were stacked in layers and salt was spri between. For small fish like tamban and ke the fish, salt and brine were stirred up with a as to ensure that the salt as more or less distributed. Pieces of bamboo netting we placed on top of the fish and stones about si in diameter, were then placed over the netting. This helped to keep the fish in th The salting process was allowed to go on days or more. After that, the salted fish we out in baskets, made of thin rattan in such a v there were numerous holes of 1″ diameter sides and bottom to facilitate draining, and with sea water. After rinsing the superfluou was allowed to drip off and the sun-drying was started.

The brine found in the salting tubs at the the salting process was found to vary from 100° when the strength was determined with a meter. After about ten days the residua would get stale and would be discarded. T used in Malaya was imported mainly from T Arabia and Egypt. The Thai coarse grain preferred because it was cheaper and deli more slowly and would thus be more econo use. Although the content of calcium an nesium salts was definitely higher than tha fine grade British fishery salt and the deter in the fish protein resulting from the use o grade salt was correspondingly greater, it appear that the Asian population rather f the flavours developed as a result of thi deterioration.

Sun-drying process.—Sun-drying of the sa was carried out on structures called plant plantar consisted of a platform of planks w ports consisting of poles, usually nibong, pl the sea or on the foreshore according to stances. Very often the planks were repl the bark of nibong or areca nut tree trunk combination of poles were bound together seizing wire or nails.

s of matting (10′ × 5′) made of pandan or ang leaves (*Pandanus* sp.) were spread over r of the plantar and the fish to be sun dried ranged on them in a single layer. They ned over frequently in the course of the day. ing usually started at 7 a.m. in the morning ather permitting, was continued till 5 p.m. vening. If there should be a shower, half of ce of matting was turned over to cover the alf so that the fish was sandwiched in bet- If the shower was expected to be prolonged e matting together with the fish was folded kept in the shade. The duration of the sun-drying process varied between ten hours to thirty hours depending on the weather.

Nature of product.—Different types of salt fish as produced by the fish curers in Malaya were analysed. It will be seen from the table below that the moisture content was still very high. Bilis is in a class by itself. Its length varies from $\frac{3}{4}$″ to $2\frac{1}{4}$″ and dries rapidly as compared with the other types of salt fish—hence its low moisture content.

The following table gives the results of analysis of locally salted and sun-dried fish as found in the Singapore markets :

Type of fish	Moisture percentage	Sodium chloride percentage	Protein percentage
..	25.04	6.10	59.45
..	48.82	17.33	29.18
..	53.72	14.03	27.32
..	43.86	17.00	31.36
am ..	48.54	17.34	27.95
..	36.85	13.95	38.16
..	50.52	17.47	21.73
..	54.88	14.87	25.08
..	48.38	17.67	27.10
..	60.25	19.28	19.61
..	48.82	13.23	32.29
..	65.80	12.67	18.37
..	43.94	12.11	39.78
..	53.14	16.04	22.11
ning ..	39.92	9.73	34.67

fish trade in Malaya.—An average of about tons of salt fish was produced in Malaya and age of about 12,000 tons of lightly salted low sh was produced and used as fertilizer. The g table gives an idea of the estimated total ion, the imports and exports of salt fish in lay Peninsula (excluding Perlis) for the year There was always an excess of exports over imports amounting to about 11,000 tons. Singapore's production of salt fish (excepting a small quantity of dried bilis) was practically nil. With regard to salt fish, Singapore formed the centre at which salt fish, not only from the Malay Peninsula, but also from the other parts of the world, was collected. After sorting and repacking the salt fish was distributed,

State	Fresh fish landed	Salt fish produced	Imports	Exports
..	6,000	2,800	..	2,608
..	7,000	700	..	..
Wellesley ..	3,600	600	..	..
..	21,500	6,500	1,309	3,806
..	9,000	3,600	189	3,413
..	16,300	2,500	1,431	40
mbilan ..	400	50	542	37
..	3,000	300	..	..
..	6,000	1,200	2,306	997
u ..	12,400	6,200	..	6,125
..	700	300	..	274
Total ..	85,900	24,750	5,777	17,300

* Quantities in tons.

some to the Malay Peninsula and the rest to Java, Sumatra, Borneo and other parts of the world. The entrepot trade at Singapore with respect to salt fish and other marine products has been described in details in a separate paper.

Fish maws.—These consist of the swim bladders of fishes and marine eels. In Malaya the swim bladders of the following types of fishes are used :—

(i) Sciaenidae—known locally as Selampia. Their swim bladders are elongated.
(ii) Polynemidae—known locally as Senohong. Their swim bladders are rounded.
(iii) Muraenesocidae—known locally as Melong. The swim bladders of eels are also elongated.

They are removed from the fishes or eels and all extraneous tissue cut off. They are then cut open, scraped to remove blood vessels which may be adhering, washed and then stretched on bamboo frames to dry.

They are used by the Chinese for the preparation of one of the more costly items on their menu. They are also regarded as having medicinal value. The present market price for large maws of good quality is about M $800 per picul.

Shark fins.—Shark fins form one of the major courses in a Chinese dinner and this demand has created a business in this particular commodity. The pectoral, ventral, anal and caudal fins of sharks are utilised. The dorsal fins are also utilised, but often sold independently. They are cut from the shark and then dried in the sun and marketed in the dried condition.

Before use the fins are soaked in hot water to soften the skin which is then removed together with the bony portions. What remains is the gelatinous edible material.

Commercially they are graded into ' white ' fins and ' black ' fins. The ' black ' fins vary in colour from grey to brownish. The ' white ' fins are much lighter in colour and are more costly because the gelatinous portion is greater than in the ' black ' variety. The large ' white ' variety costs as much as M $800 per picul whilst the large ' black ' variety costs about M $300 per picul. The larger the fins the more costly they are.

The local production is small compared to the amount imported for local consumption or re-export.

Ikan Kayu.—This consists of chunks of tuna flesh which have been dried and smoked over red hot charcoal. It is almost as hard as soft wood and hence its name Ikan being fish and Kayu being wood in Malay. Before it can be used it has to be scraped with a blunt knife and the shredded meat is then used extensively in preparation of curries. is now no local production, as fishing for tun considered profitable at present.

(*b*) *Current and proposed research work*:

(i) No investigations are at present bein on the preparation of dried fish trials have, however, been initia study the storage of dried fish in dioxide.

(ii) Initial experiments have been condu determine the advantages of storin fish in polythene wraps. These ments were suggested by a seri ducted in Singapore testing the ef of polythene wraps in retaining texture and flavour of deep-froz Preliminary results obtained in polythene-wrapped dried fish temperatures are promising.

(iii) It is considered that the experimenta cation of artificial drying tec would be profitable if studied in to the highly developed taste pre of the Malayan consumers. Tra techniques impart a marked fla processed products, the result of spoilage. The sterile product of techniques is not acceptable. ingly, it would be useful, were expe made to determine the possibility mitting controlled spoilage, reducing the keeping qualities product, in the mechanical proces the fish.

The primary object of the polythene an experiments is the improvement of bulk sto dried fish on the east coast of the Peninsu the onset of the north-east monsoon there almost complete cessation of fishing operati some three or four months, and so, prior to th soon a large proportion of the fish landings and stored. The quantity so dried is nec limited and it may happen, if the monsoon is supplies are inadequate. In any event, c able deterioration of the dried fish stock occ distributions towards the end of the monsoon are often of poor quality. Our experiment gramme aims at developing simple, inex storage methods to permit of better and longe able supplies.

Secondly, in the CO_2 experiments me above, it was found that the anchovy could b for long periods in a CO_2 atmosphere suffering any deterioration excepting after months' storage, a browning or reddening

This result reduced the value of the stored This phenomenon is not, it is reported, the of bacterial or fungal action. It would be while having this investigated.

rther series of experiments planned to study nufacture of fish meal by a small scale pilot perated in the fishing villages and utilising for ost part the trash fish of bignet and fishing atches began only this year.

ysis of experimental batches prepared have that a very satisfactory feeding stuff can be ed from these fish. The operation of this besides affording an opportunity to study the al difficulties involved in manufacture of tory meals for animal foodstuffs and fer- would measure the economic advantage, if mechanical drying against the existent tradi- method of sun-drying. Sun-dried products ash fish are sold locally for pig and duck feed. acture of a fish meal with superior keeping s would allow wider distribution and would e economical in respect of transport and, as rchase would be possible, of purchase costs tock-keepers. Again the present form of the ed trash fish renders it unsuitable for use as ser. It is considered a local fish meal could compete with expensive imported fish meals.

lonesia

Current processing and storage methods.—These resemble those employed in the Federation aya and Singapore (above).

Current research work.—Nil.

Proposed investigations.—Indonesia will prob- willing to carry out some of the investigations d in the general research programme (below). eration will be given to compiling analytical tudying the effects of impurities in the salt quality of salted dried fish; studying the use d antiseptics in prolonging storage life; g the use of special containers designed to water uptake and insect infestation during

lia

Current processing and storage methods.— quantities of dried fish are produced during stal fishing season (November to March). ethod usually adopted is to sun-dry on the after a preliminary salting. However, in eas no pre-treatment with salt is carried out, requently, unpopular species which have no narket as fresh fish are dried as whole fish gutting. In such fish extensive putre- faction often takes place, making it scarcely fit for human consumption.

In some States, the pre-treatment of fish with salt prior to drying is enforced by legislation, and fishing salt is made available to curers at subsidised rates.

Since curing is carried out during the dry winter months, the curers usually have little difficulty in effecting adequate drying of the products. On the whole, insufficient care is exercised in the preparation and handling of dried fish in India, and as a result there is often considerable losses of nutrients during storage and the onset of bad odours due to rancidity and decomposition of viscera.

(*b*) *Current research work.*—Nutritional studies and analytical data on sun-dried fish (West Bengal). Investigations of the effects of improved methods of preparation including salting, on the nutrients and chemical composition.

Publications.—(i) 'Nutritional Investigation of Sun-dried Fishes Available in Bengal', Saha, K. C., Deb, A. and Sen, D. P. *Ann. Biochem. Exp. Med.*, 1949; 9, 9.

(ii) 'Nutritional Investigations on the Sun-dried Fish of West Bengal'. Saha, K. C. and Chowdhury, N. K. *Ann. Biochem. Exp. Med.*, 1951; 11, 193.

(*c*) *Proposed investigations.*—Not available.

6A. **East Pakistan**

(*a*) *Current processing and storage methods*: Fish are sun-dried during the season of glut in districts where fish are surplus and transport facilities are poor. Fish which are of big size, no matter to which species they belong, are gutted and made into fillets and exposed to the sun for drying. On the other hand small fishes are dried whole. The fish are spread on mats or hung up by strings for drying. It takes about a week when the weather is fair.

The dry fish are kept on mats in huts for some time. On the approach of summer they are transferred to big earthen-ware vessels with a neck in which fish oil was previously allowed to soak for a considerable time as a measure to protect against moisture. The container when packed with dry fish is buried underground up to its neck. In some cases trenches are dug in the earth. In these trenches when lined internally with mats dried fish are stored and covered by sand or soil. This treatment apparently protects the dried fish from the attack of insects and helps in restoring a uniform consistency through the bulk.

Further details are given in an article by Nazir Ahmad 'Preservation & Curing of Fish in East Pakistan', *Pakistan J. Sc.*, 5 (1953), pp. 117-122.

(*b*) *Current research work.*—Nil.

(*c*) *Proposed investigations.*—Owing to lack of funds, investigations cannot be undertaken at present, but two lines of study are proposed :

(i) The use of cold storage of dried fillets as a means of prolonging the storage life, particularly during the wet season.

(ii) To test the smoke curing of partially dried fillets as an alternative method of prolonging the storage life. It is suggested that when drying is almost complete, the fillets could be transferred to a smoke-house and hot smoke applied until the dried fillets have reached the final stage.

6B. West Pakistan

(*a*) *Current Processing and Storage Methods.*—

Dried Fish—Small fishes are sun-dried and later used in the preparation of fishmeal and manure. Only *Harpodon nehereus* (Bombil) is sun-dried and used for human consumption.

Salt Fish—dry cured—applied to all big teleostean fishes. The fish after being split and incised are smeared with salt and put in pits for 18-24 hours, washed in seawater and then dried in the sun on ground, on mats and on top of the curing yards on the Mekran Coast.

The Sharks and Skates are skinned and long steaks cut. Only the wings of the rays are cured.

Shrimps are boiled in strong brine for about two hours, dried in the sun, thrashed with sticks and cleaned of shell. These are stored in dry places and exported in gunny bags or mat packing. Shark fins are separately cured. Fish maws, obtained from thread-fins, croakers and cat fishes, are split open, cleaned and dried in the sun.

Salt Fish—wet cured—not generally practised ; only on special demand this type of curing is done.

General remarks.—

(i) Only wooden drums are used and as far as possible metal containers are avoided.

(ii) There are no standards as regards salt, moisture and sand content.

(iii) Completion of cure is judged by appearance, smell and firmness of the flesh. It has been proposed to standardize and classify the products.

(*b*) *Current and Proposed Research Work and Improvements.*—

(i) Analyses of different kinds of salt used in curing and improving quality of salt.

(ii) Drying the fish in shade after curing on barbecues instead of on sand.

(iii) Dry curing vs. Wet curing.

(iv) Construction of Government curing at different places on the coast improved methods will be introdu improving the products.

(v) Improvement in storing methods.

7. Philippines

(*a*) *Current processing and storage methods.*—*fish.* Drying fish without the use of salt is c to dilis (*Stolephorus* sp.) only because of its size and low fat content.

After washing with clean sea water, the spread on buri or split bamboo mats and su for 2-3 days, the length of time depending weather. Fresh fish dried during good weat better in quality than those dried during bad w During rainy days the dilis is converted into fish paste (bagoong). Drying of fish in the with artificial heat would improve the qua dried dilis.

Because of the negligible amounts of salt a and high mineral and ash content, dried dili excellent fish meal for human as well as poult

The ordinary container for dried dilis is jut A much cheaper and appropriate container fo dilis is the buri sacks which protect the produ dust and foreign materials.

Salt fish—dry cured.—Large species th preserved with this method are as follows :

1. Talakitok (*Caranx* sp.)
2. Dalangang bukid (*Caesio* sp.)
3. Maya-maya (*Lutjanus* sp.)
4. Tulingan (*Auxis thazard*)
5. Alumahan (*Rastrelliger chrysozonus*)
6. Banak (*Mugil* sp.)

After splitting the fish the gills, viscera an are removed with the aid of a hard brush ; with sea water ; dry-salted and then arrange meat side up in wooden vats. The fish are w down and after six hours or when firm, amount of brine is added (one part salt to water). The next day the fish is removed fr brine and then washed thoroughly with sea w remove excess salt, and dried in the sun o bamboo mats for 2-3 days, the drying time d ing upon the size of the fish and the weather.

The use of a hard brush to remove comple viscera and blood improves the colour of th duct.

Bacterial fermentation often occurs dur process of sun-drying the fish, especially dur

. Drying in the shade with the use of l heat would improve the quality and taste of shed product.

ɔpine solar salt contains high percentages of ies, namely, magnesium and calcium salts. ıe common belief in this country that more ıld preserve fish longer, a tremendous amount l fish is lost annually due to moulds and bacɔntamination.

ish—wet cured.—Species of fish salted by the ed method are as follows :

Hasa-hasa (*Rastrelliger brachysomus*)
Salay-salay (*Caranx kalla*)
Sap-sap (*Leiognathus* sp.)
Tamban (*Sardinella longiceps*)
Tunsoy (*Sardinella fimbriata*)

fish is cured in concentrated brine solution hours, and after washing with sea water it is the sun on split bamboo mats for 2-3 hours. ıers for dried fish, either split or whole are boxes of 25-55 kilograms net. Problems to those encountered in other salted dried also found in the case of this product.

o. This salted tamban (*Sardinella longi*d its preparation in a big business in Minnd the Visayan Islands.

ish is immersed in concentrated brine for at hours. From the brine it is allowed to drain hly and then packed in bamboo baskets lined per or banana leaves. Each layer of fish is with salt and more salt is added on the last r for protection from flies. The product is y and commands very low prices in the The product is often shipped in wooden bamboo baskets of 55 kilograms nett.

search work in progress.—None.

oposed research work.—

Drying of salted fish with the use of pure alt and artificial heat for drying.
mproved methods for the manufacture of moked fish.
hemical analysis of dried fish for the purose of standardization.

ed States of America

rrent processing and storage methods.—The ɔn of dried fish in U.S.A. is probably neg-

rrent research programme.—A programme eeze-drying of foods, including fish, is now ess at the Food Technology Department, University of California (at Davis). No results have yet been published.

9. Hong Kong

The paper by McCarthy and Tausz (' Salt Fish Industry in Hong Kong ', Government Printer, Hong Kong, 1954), published by the Marketing Department of Hong Kong gives a full description of the construction and operation of a mechanical fish-dryer (pages 23-30), of the advantages of its use (pages 12-14) and of the keeping qualities of the fish dried (pages 34-35).

The drying machine is hygienic, independent of the weather, and reliable ; it dries the fish at a temperature of 80°F. and a relative humidity of about 50%. Since salt fish absorbs moisture at a relative humidity higher than 72%, and Hong Kong humidities are very rarely below this figure, it is possible to air-dry fish only in direct sunlight, which lowers the humidity by raising the surface temperature of the fish. With heavily salted fish, it is possible to wait for favourable weather, though a prolonged drying time must mean excessive handling and deterioration in quality. If the fish is but lightly salted, then the fish is likely to go bad unless favourable drying weather at once presents itself. It is found then that the machine-dried fish tends to be better in quality, more uniform and more evenly dried than sun-dried fish ; it is immune from the losses due to bad weather.

Where the retail market, as in Hong Kong, is close at hand, dealers tend to dry fish inadequately. However, with a quick sale this is not important. For export or prolonged storage it must be well dried—to about 40% moisture content. Well dried fish keeps fairly well even in hot humid weather for three weeks to a month, though there is a tendency to absorb moisture and to lose salt by drip. For export to a distant market, or for prolonged storage—beyond a month—the temperature should be below 45°F. and the relative humidity below 72%. In these conditions the fish can be stored almost indefinitely.

GENERAL COMMENTS ON THE PROBLEMS OF PROCESSING AND STORAGE

In the majority of Indo-Pacific countries, simple drying or salting combined with drying is the most important form of fish preservation, enabling people living at considerable distances from fishing centres to enjoy useful additions of much-needed protein to their diet. It is surprising therefore that there are so few technical data in respect of many indigenous processes. Except in a few instances, reliable information is not available on such basic characteristics as moisture, fat and salt contents ; rates of

drying in relation to meteorological conditions; storage life as a function of temperature and relative humidity of the air, to cite a few examples.

Simple improvements in processing methods are probably needed in many traditional dried products, with the aims of making the fish curer independent of the vagaries of the weather and of producing a more uniform product. The extent to which such improvements can be effected will vary considerably from country to country and will depend on the economic status of the fishermen and in particular on their ability to meet the cost of improved equipment and methods.

Improvements in keeping quality of many types of dried fish, particularly during the wet, humid season of the year, are urgently needed. For economic reasons, cold storage is unlikely to be feasible except in a few favoured localities. Other methods of control of deterioration must therefore be tested, such as lower initial moisture contents; storage in containers which restrict the uptake of moisture and prevent insect attack; and possibly the use of mild flavourless disinfectants known to have negligible acute and chronic toxicities to man.

PROGRAMME OF INVESTIGATIONS

Of the eight countries which submitted information, three (Ceylon, India and the Federation of Malaya and Singapore) currently have active investigations proceeding, details of which are given in the preceding sections. Several other countries have signified their willingness to carry out investigations on some aspects of the preparation, processing and storage of dried fish.

It is clear that there is an urgent need for systematic investigations. Consequently, a draft programme was circulated to representatives of all member countries for their comments. As the result of replies received from eight countries, the following programme has been drawn up. At the forthcoming session of the Council at Tokyo, the representatives of the respective governments have been asked to come prepared to state what part, if any, of the research programme their country will undertake. Additions and alterations will no doubt be found desirable when the investigations are in progress and the initial data are examined and collated.

(*a*) *Analytical data.*—The customary range of moisture, salt and oil contents of dried fish and salted dried fish immediately after preparation.

(*Note.*—These will vary widely from region to region and should be obtained by each country producing substantial quantities of these products.)

(*b*) *Methods of preparation.*—

(i) In areas where rain and dull weath interfere with the preparation of dr studies of the use of simple forms c drying with artificial heating. (These studies will probably also investigations on the extent to wh temperatures during drying can be without impairing the quality of t ducts.)

During the dry months, it may be in certain areas to test the effects o drying by exposure of fish fillets to and subsequently to complete the vation by hot smoking in bins or sh is understood that this process w economically feasible in at least c (East Pakistan).

(ii) The effects of impurities in the sal quality of salted dried fish.

(iii) Any other important aspects of p tion which may be peculiar to regions and forms of processing.

(*c*) *Keeping quality.*—

(i) Careful surveys to determine the sto of each dried fish product and t mine approximately the amount c age leading to rejection; and to precisely the major causes of such ration.

(ii) For dried fish products found to hav adequate keeping quality, experim vary procedures of preparation w aim of getting better keeping Such experiments might include th of moisture contents lower than ary. These experiments could be in conjunction with experiments su in (b) (i) above.

In products where the storage life minated early by the attack of organisms, the incorporation o relatively harmless antiseptics, s boric acid, should be tested.

(iii) Investigations on the use of stora tainers, preferably as large as p with the object of restricting the u moisture by the dried fish and e insect attack. These tests might n to include studies on the inclusion quantities of fumigants, such as dibromide, in the sealed containe inherent insects and their eggs.

) Where economic circumstances warrant it, and where large quantities of dried fish are normally stored for considerable periods of time, experiments on cold storage of the products.

Since, normally, the higher the temperature of storage, the cheaper will be the storage charges, it would be advisable to conduct experiments at each of three temperatures —say O°C, 7°C and 15°C, in order to gain information on the highest temperature which holds the products in a satisfactory condition for the desired periods of time.

Standards of quality.—Detailed information from the above investigations, particularly alytical data, together with consumer preferests, may be used to assist in drawing up rds of quality for each product. The setting such standards, perhaps enforced by legismay help considerably in raising the initial and keeping quality of dried fish products.

ICIPATION IN RESEARCH PROGRAMME

following countries have signified their ness to undertake investigations on some parts programme.

ylon.—Work is in progress on parts of (b); could undertake work on (a), (b) (ii) and (c) (i).

deration of Malaya & Singapore.—Work is in progress on some aspects of (c) (i) and (c) (iii).

dia (West Bengal).—Work in progress on (a); desires further work on (d).

donesia.—Subject to sufficient financial aid forthcoming, could carry out investigations on (a), (b) (ii), (c) (ii) (2nd paragraph) and (c) (iii).

st Pakistan.—If sufficient funds were made available, prepared to carry out investigations on (a) and (b) (i).

APPENDIX

ER RESEARCH WORK IN PROGRESS N FISH AND MARINE PRODUCTS ROCESSING AND PRESERVATION

lia

ental investigations.—

Studies on the denaturation of fish muscle in frozen fish.

Breakdown of urea and trimethylamine the flesh of elasmobranch fishes during bacoilage and as the result of heat processing.

(3) Heat-inactivation of the tyrosinase enzyme which is responsible for the development of melanin-like substances in certain tissues of cooked prawns.

(4) Development of techniques for the rapid estimation of volatile bases in fish muscle.

Applied investigations.

(1) *Prawns.*—A survey has been made of the conditions of handling raw and cooked prawns between catching and marketing in the iced state. A special study has been made on the condition known as 'black-head' in cooked prawns.

(2) *Crayfish.*—Studies have included measurements of weight losses during various cooking procedures and of changes occurring in raw and in cooked flesh during frozen storage.

(3) *Shark.*—The canning quality of the flesh of one species of edible shark has been investigated. Studies have also been made on the post mortem development of ammonia in shark stored in ice.

(4) *Miscellaneous canned fish.*—Work has been carried out on improvements in out-turn of various Australian species of canned fish, shell-fish and crustaceae. A programme is to be commenced in order to determine the canning quality of certain species of tuna which are not at present being canned in Australia.

Ceylon

(1) *Shark liver oil.*—Oil is extracted from the livers of sharks and related species on a commercial scale. The oil is purified, tested for its Vitamin A potency and blended with groundnut oil to a uniform Vitamin A content of 3,000 i.u./g. This oil has a ready market as a substitute for cod liver oil and the demand is greater than the supply.

(2) *Agar from local seaweed.*—A survey of seaweed beds was made and various samples from the beds were analysed. The survey showed that large amounts of raw material for an agar industry are available.

(3) *Whole fish analysis.*—This is a long-term project to determine the protein, fat, moisture and ash content of various fish. The information acquired will be useful in fish meal production and liver oil extraction. The figures will also give an indication of the food value of the fish.

(4) *Liquid fish.*—This useful adjunct to fish meal production is being investigated. Fish are ground up and placed in jars containing formic acid. After a few weeks the fish is reduced to a liquid state which is stable. The liquid can be used as an animal feed or as a fertilizer.

(5) *Curing of porpoise flesh.*—This is being attempted on the experimental scale using a standard sweet pickle formula. Preliminary results are encouraging and further work is in progress prior to exploring the market possibilities of this type of food.

(6) *Storage of fish in cold brine.*—An experiment in a small refrigerated tank showed that fish can be successfully stored for a few days in cold brine. This gives a better product than iced fish due to uniformity of cooling and exclusion of air. The fish appear fresh and do not have the flavour peculiar to deep-frozen fish. Fading of gill colour can be prevented by adding sodium nitrate to brine.

India

(1) Studies on the keeping quality of fish meal used as a poultry food c.f. Saha, Sen & Sen, *Ann. Biochem. Exp. Med.*, 1951, **11**, 197-202.

(2) Preservation of fresh fish with ice containing preservation chemicals c.f. Saha, Sen & Sen, *Ann. Biochem. Exp. Med.*, 1951 ; **11**, 181-192.

Philippines

(1) *Production of galongong (Decapterus macrosoma) fish meals and studies on their comparative food values.*—Galongong fish meals prepared under three varied conditions were bio-assayed for comparative study as to food values. The proximate chemical composition as well as the mineral content of the fish meals were also determined.

(2) *Utilization of galaman-dagat (Gracilaria confervoides)*—Galamandagat, a seaweed which appears annually in commercial quantities along the shallow shores of Manila Bay is being investigated to find its possible use as a substitute for imported commercial agar. At present it is used directly as food in the form of salad and also as supplementary feed for the bangos (*Chanos chanos*, Forskal).

(3) *Availability of calcium in various fishery products.*—The availability of calcium in shrimp paste (*bagoong alamang*), dried small shrimps (dried alamang), canned bangos, and other fishery products is being investigated. These sources are common and easily available to average families at very low cost. They may be considered as good substitutes for milk, which is an excellent but expensive source of calcium in the diet.

(4) *Purification of oysters.*—To safeguard the health of the consuming public, experiments on purification of oysters by the use of crude aureomycin are being undertaken.

(5) *Food value of deodourized fish flour.*—A comparative bio-assay of deodourized and non-deodourized fish flour is being undertaken to determ effect of deodourization with organic solvents food value of the product.

U.S.A.

Extensive investigations on the preservat fish by icing, freezing and by canning, at Technological Laboratory, Fish and Wildlife S Seattle and elsewhere ; but detailed researc gramme not yet available.

Thailand

1. During March 1955, the Governm Thailand adopted the resolution that only salt of good quality be exported from Thailand, a authorized the Fisheries Department to cond inspection and the certification.

2. Exporters of (pedah salted and *Rastrelliger*) must declare whether the pro *On Standard* or *Under Standard* and wheth (oily) *Pedah* or *White* (slightly oily) *Pedah*

3. Pedah *On Standard* requires the fo qualifications :

Grade Special	1,000	fish	weigh	40 l and u
Grade I	1,000	,,	,,	36-39 l
Grade II	1,000	,,	,,	31-35 l
Grade III	1,000	,,	,,	25-30 l
Grade IV	1,000	,,	,,	21-24 l
Grade V	1,000	,,	,,	15-20 l

All fish in each lot and each grade are alike i and have fine external condition. It must broken, badly bent, torn and badly ragged. fish are allowed not more than 5%. A ver mum or no entrails and gills may remain.

4. Dryness is accepted on the conditi no liquid appears when pressing stomach an

5. Characteristic odour of pedah.

Any Pedah, failing to conform with the requirement, is certified as *Under Standard.*

6. Pedah, except that of Grade V, n packed, in layers, in wooden cases (An emp with lid, nails and wire must weigh 30-34 kg

III. SOCIO-ECONOMICS AND STAT

Chairman—Mr. D. W. Le Mare

Contributions have been received from the ing countries : Burma ; Ceylon ; India ; Ind Japan ; Pakistan ; the Philippines ; Thailand United Kingdom. No contributions hav received from Australia ; Korea ; the Neth

et Nam. It is assumed that the United States, no specific problems under the Headings for nel's work, has not in consequence sub- any contribution.

e were five subjects allocated for attention the period since the Fifth Session of the .,

- Advances in the collection of adequate fisheries statistics, including sampling survey methods in the production phase.
- Socio-economic problems affecting the production and distribution of fisheries products; their solution.
- Advances in the development of fish marketing and distribution; development of consumption of fisheries products to improve nutrition; the effect of consumer tastes for non-customary products and means of influencing them.
- Development of fisheries extension service (i.e. the extension of scientific knowledge to the level of the fisherman and fish-farmer.)
- Significance of fish-culture as an integral part of rural economy.

e area covered by the Indo-Pacific Fisheries , a proper appreciation of human values is tedly the underlying factor which conditions gress of all workers in the field covered by ; fishing has been pursued at a peasant level uries, and it is the peasant fishermen among he Government official has his major work This is even true of Japan where the fishing is the most highly developed in the area, winning of the confidence of people whose e is spent at sea, using their experience to ie the rigours of the weather and to reduce n degree of uncertainty which exists in the industry, bound by superstitution and tradi- eliefs, is most important.

nly is it the sea fisherman who must receive ition of the Government worker, but also the ural peasant who adopts a procedure of fish- as a means not only of augmenting his in- it also of adding to his own diet. Perhaps e quickly obtainable results of fish culture s in ponds and rice fields have been a stimu- orkers as a means of increasing protein food and in this field it is clear that good progress n made. It is encouraging to note that taking as a whole, considerable progress is being nder each of the five headings listed above, ill lead to a better control of the fishing in- for the purpose of extension and develop- ork, which already is producing more fish as food for the rapidly growing populations of the Indo-Pacific area, while at the same time widespread attention is being given to the social and economic status of the producer.

During the 1953-55 period all territories which have reported, have made some advances in statistical procedure. The advantages of sampling procedure have been firmly grasped by Governments and the discipline of the trained statistician has been brought to bear in many instances in order to refine methods and expand the fields covered by the results of analysis. It is clear that the fundamental importance of sound statistics has been universally appreciated but in one or two cases, for domestic administrative reasons, the progress wished for by Fisheries workers has not yet been achieved. It is equally clear that a sound foundation is being laid, which after an adequate time interval will provide comparative data of extreme importance.

1. *Advances in the Collection of Adequate Fisheries Statistics, including Sampling Survey Methods in the Production Phase.*

In *Burma* a programme for the systematic collection of fisheries statistics is under active consideration by the Government. Already some progress has been made in collecting fundamental data. In this country, Fisheries may be classified under two sub-heads, 'Open Fisheries' i.e. riverine, brackish-water and marine fisheries. For these a register of licensed fishing unit is kept. The number, type and size of fishing implements, by locality, are recorded but so far neither the operators nor the craft are registered. The other category is that of 'Leased Fisheries' i.e. naturally impounded fresh-water lakes and creeks adjoining them, for which the number of units and the revenue collected is registered but no register is kept of the operators, their gear or craft. District Revenue Officers furnish rough estimates of annual fish production and disposition of catches.

In *Ceylon* the present method of collecting statistics is by issuing schedules to the field staff of the Fisheries Department stationed at various fishing centres along the coast, and this has been found to afford little truly accurate data as many of the returns are based on approximations and not on personally recorded observations. Adoption of a statistical system of collecting fishery information, modified from the Indian pattern, has been suggested for trial and is now in hand. The plan of statistical collection has been drawn up as follows :—

1.1 Factors of production.
- 1.11 Man-power
- 1.12 Equipment, craft and gear, etc.
- 1.13 Finance

1.2 Operation of the factors of production.
1.3 Production volume and value, landings specified by species and in respect of gear used, money values realised at the first wholesale.
1.4 Cost of production.
1.5 Factors of distribution.
1.51 Man-power
1.52 Equipment
1.53 Finance
1.6 Operations of the factors of distribution.
1.7 Cost of distribution.
1.8 Volume of supply.
1.9 Prices.

Continued statistical collection is on 1.11, 1.12, 1.2, 1.3, 1.51, 1.52, 1.8 and 1.9. Information on other items of the programme has to be sought after a sample survey which could be undertaken only after the completion of the registration of fishing craft and gear.

Besides the routine statistical collection, statistical studies are made on different analytical problems which are biological, technological and economic, a few of which being :

(*a*) The study of the seasonal variation of fish landings and fish prices.
(*b*) The seasonal fluctuations of fresh water fish landings and its correlation with ice dispatch, rainfall, temperature, etc.
(*c*) Study of the foreign trade in fish products and its position in relation to the trade in other commodities.
(*d*) Analytical treatment of trawler data.
(*e*) The mechanization of local craft and its advantages over non-mechanization.

The primary method of statistical collection is by enquiry and report by the Inspectors, fish receipts as found in some countries being absent. Steps are at present taken to register fish dealers in the island, who will be requested to submit their monthly transactions. These statements will contain basic information for further biological, technological or marketing studies. Information on the dispatch of fish by the railway is collected by the Inspectors at the different rail heads.

Two items of major statistical importance are a sampling survey of fish catches to test the accuracy of the present incoming data and then to work out a method of obtaining information on catch and operation with minimum labour and inspection with a required degree of reliability and also a survey of a representative sample of the fishery population.

In *India* the Central Fisheries have taken the lead in this matter. The Central Marine Fisheries Research Station at Mandapam initiated a sample survey in 1949 to estimate marine proc The whole coast line was divided into 12 zon similar patterns of fisheries. In each zone, fishing villages were chosen and a survey a took readings once every fortnight when each type of fishing unit, their landings, et recorded. From these sample data, th production was worked out. Based on this r the total catch of marine fish in India for t five years is :

Year	Landing in tons (1 ton = 2,240 pounds)
1950	570,860
1951	525,482
1952	520,002
1953	572,278
1954	581,259

Collection of statistics for inland waters many difficulties in India, and sampling r are being developed and tested, both for total tion and for the production of fry. Proce being decentralised to State level.

In *Indonesia* the main effort is to de geographically comprehensive statistical se cover the extensive Indonesian Archipelago are collected by various means according to ministration and organisation of the locali the collected data are at present only appr The estimates are based upon the enumer fishing vessels and gear engaged in the fishe daily or periodical questioning. Sampling methods in the production phase are practised. At present the principal data sou the total amount of fish caught, the localit fish is landed, the species and the value of landed. The number of basic species upo the overall comprehensive data are based h increased from 12 to 20. Coverage of area concerned involves a very great amount

In *Pakistan* a programme has been planned to evolve a good and rational s service. Prior to 1953 a survey was made power, craft, and gear. In 1954 a compr survey of fisheries resources was instituted. a pilot survey was undertaken in Karachi Adr tion Area, to collect data with accuracy, to te national comparability and to coordinate phases of the industry, e.g. catching, hand distribution. This survey is now being e to the Sind and Baluchistan Coasts.

During this survey, the Fishing Uni defined and classified into categories and a tory was prepared. Statistical data on the and types of fishing craft and fishing gear, in the preliminary study were compared

change of units was recorded. The amount t engaged was also measured in some cases.

om sampling methods were adopted to the landings and operations of the boats major centres in the Karachi Administration nd valuable information was thus obtained ng quantity and seasonal variation of fish

uction, landing and utilization of fish is ent assessed on a country-wide basis, by c statistical collection, in the absence of a system.

data on imports and exports of fresh fish l products to and from Pakistan are collected arly routine. Comparative studies are made nds of use to the industry are predicated.

data collected in the preliminary survey of Pakistan marine fisheries has already been ed in the series 'Investigation Reports'. cal papers regarding statistical information ; to marketing, production, valuation, external ernal trade have been issued and information d to interested parties.

apan the present system of compiling monthly on marine fisheries has been in operation 951. Sampling surveys have been conducted st of the major fisheries and considerable ements were made in 1953. The items now the number of fishing units, and the number made per unit by types of fisheries, catch s of fisheries and by species. The number ng units and trips, as well as the catch, are oken down according to the tonnage of the As a result of these developments, it is now to fully appreciate all production aspects nese fisheries.

pplying the principle of sample surveys to s statistics, efforts have been made to record ly the actual conditions of the fisheries, in the remarkable differences existing between f fisheries as well as between fishing areas.

Second National Fisheries Census was ed in 1953, by which the number of fisheries ses, operators and employees were clarified the amount and value of their catches. A y of the Census was published in August, nd detailed reports will be completed in future.

ne *Philippines* activities in statistical work mained restricted to the relatively limited eported in 1950. An inventory of the fishing d in the country in 1953 has been made and ble. While the adoption of sampling survey in improving the collection of statistical data is under serious consideration, lack of funds, coupled with lack of personnel adequately trained in sampling survey work, prevents progress for the present.

In *Thailand*, statistical work has been limited by poor communications in certain areas. It has been estimated that there are more than 50,000 fishing operators engaged in full-time fishing at sea. As far as inland fisheries are concerned, most of the farmers in the extensive rice-growing areas are part-time fishermen. They operate both for home consumption and sell the surplus production to middle-men or agents who bring the fish to market. Altogether it is estimated that about 300,000 tons of wet fish from all sources, including Molluscs and Crustacae, worth approximately 900 million Bahts are produced. From this, approximately 20,000 tons of salted and dried fish, worth approximately 45,000,000 Bahts are exported.

As regards *United Kingdom* territories, in the Federation of Malaya and Singapore, considerable progress has been made in the refinement of statistical procedure by the universal adoption of tested sampling procedure for the recording of data. This has meant a considerable saving in time and has enabled staff concerned to widen their field investigations and to make more accurate recordings. Procedure is currently in hand to codify all data collected, with the assistance of Organization and Methods specialists from the British Treasury, so that when all data are collected, they may be processed on new statistical machinery installed by the Federal Government. It is estimated that only 2 hours per week by a trained operative will be required to provide coordinated and correlated data over a wide field. Associated with this, is a reclassification of fishing gear and craft adapted to changes in the industry. During the past two years, two detailed marketing surveys have been conducted in Singapore and Penang, involving a great deal of intensive statistical recording, in order to provide data for future market and town planning.

A description of the *Hong Kong* Fish Marketing Scheme was given in a paper presented at the Indo-Pacific Fisheries Council in 1954. In the summer of 1954, the Food and Agriculture Organization of the United Nations held, in conjunction with the Hong Kong Government, an FAO/ETAP Fish Marketing Training Centre at which the Hong Kong Fish Marketing Organization was held as an example. It may therefore be reasonable to assume that most territories of the region are aware of the main functions of the Hong Kong Fish Marketing Scheme.

By far the greater part of fresh fish consumed in the Colony is inexpensive. Over 95% of fresh fish sold through the Organization last year had an

average wholesale price of HK$1.00 per catty or less. The more expensive fish (Wholesale price of HK $.100 per catty and more) includes Garoupa, White Pomfret, and other types of luxury fish which form only 2.64% of the total catch, and is mainly in demand by the more wealthy classes.

It is significant that the wholesale prices of both fresh and salt-dried fish have not increased in conformity with the general increase in the cost of living. On the contrary, wholesale prices for 1954 were the lowest ever recorded.

2. *Socio-economic Problems affecting the Production and Distribution of Fisheries Products*

In *Burma* the Government have approached this problem by giving some loans to sea-fishermen, who, of course, are the minority producers since fresh-water fish is the traditional source of protein. In the inland fisheries more than 600 producer co-operatives have been organised and fairly substantial loans have been given to some of these. In addition, they are being assisted to obtain producer-goods.

In *Ceylon* it was considered urgent, as far back as 1943, to take immediate action to alleviate the burden of the fishermen, by granting them financial aid as :

(i) loans to individual fishermen.
(ii) loans to unregistered groups of fishermen.
(iii) loans to registered co-operative societies.
(iv) marketing advances.

This was done because it was known that the average fisherman lived under conditions of continual hardship, with debts running into generations, poor returns for catch due to rings of middlemen and poor production due to primitive craft and gear. The loans to unregistered groups of fishermen has been the only unsuccessful scheme and was stopped in 1948. The scheme for marketing advances was also stopped in 1948 as a Government Marketing Scheme was established. Altogether Rs. 5,414,000 were advanced for marketing and at the end of 1953 the balance outstanding was only Rs. 448,000. In order to enable fishermen to obtain their essential requirements at concession rates, thus ensuring that part of the loans would effectively be utilized, stores were opened to supply foodstuffs and fishing supplies direct to the fishermen. In 1952, six such stores were opended and by the end of 1954 there were twenty-two. Salt is issued to fishermen at a concession rate of less than one-third of the open market price and in 1953 the quantity issued amounted to 95,930 cwt. Timber is issued for boat building from Crown Forest Reserves at one-fourth royalty rates. There is also adequate provision for the relief of distress due to loss of life, damage to craft and gear or prolonged periods weather causing destitution.

Most of the above measures were introdu the early 1940's and present conditions c amended procedure. There is, therefore, a under consideration on an island-wide basis. survey is first to be instituted to indicate th and economic conditions of the fishing popu the industrial organization, technological and an estimate of the manner in which the socio-economic programme has affected the population so far. The analysis is intended t quantitative measures of the different relati which obtain, whereby it will be possible to mine which way the different Government m need modification and whereby they need inte tion. Simultaneously, an intensive effort is made, with Colombo Plan Technical Assista develop the existing co-operative organisatio to incorporate adult education with special em on fisheries training.

In *India* the fishermen in many areas still c to occupy a place in the lowest strata of soci there are many social and economic proble traditional nature to be overcome. R vigorous attempts have been made by the C ment of India to raise the moral and m standards of all backward classes, including men, specific privileges having been given for tion and public services. While marine fis enjoy free fishing, the inland fisheries used auctioned to middlemen and the inland fis were completely at their mercy. The pol been changed at State level and it is now universal practice for the State Governm lease out their fisheries to co-operative bo inland fishermen at reasonable rates, inst by public auction. However, the Gove realises that outsiders with vested interest manage to get into the committees of mana and exploit the illiterate members. Indeb of inland fishermen to village money lenders very high, as they have usually alt occupations to turn to as subsidiary occu in times of fish shortage.

For the marine fishermen, a number of s have been organised to give them facilities direct purchase of fishing gear and co goods and for the marketing of catches fortunately, many of the marine fisherm perpetually indebted to money lenders and frankly admitted as in many places the worl the fishermen are prone to spend their earn drink. Attempts to stabilise their econo giving them advances through Co-operative have not been very fruitful, as the marine fis

incurs further debts, immediately after he is rom one. In fact, the plight of the marine ıen presents an almost insuperable socio- nic problem. An indirect method has been l in some States by the introduction of prohibi- ɔut the results have yet to be properly assessed. llowing solution to the problem is suggested report of the Government of India :

Removal of the younger generation from contact with their parents and giving education and training in a different atmosphere, in additional aspects of fisheries while maintaining the natural conditions for fishing to which they are at present accustomed.

A chain of co-operatives which would insist on the enrolment of all marine fishermen as members, managed for at least five years by Business Managers trained and provided by the State. It may be necessary to introduce legislation to compel the marine fishermen to bring their catches to the co-operative depots instead of selling it themselves and paying a high proportion of their income to the money lenders.

Efficient methods of distribution of catches will go a long way in raising the socio-economic position of the fishermen. Inland fishermen do not face this problem to the same degree and they actually enjoy a higher status than their marine brothers. In the case of estuarine fishermen, e.g. at Chilka lake, it has been comparatively simple to raise the status of the fishermen by grouping them into co-operatives for joint marketing, in view of the fact that the lake is State property and has good facilities for communication. Development of communications must proceed simultaneously with improvements in distribution and marketing procedure in the case of the marine fishermen.

bay State has given liberal financial assistance shape of loans and subsidies to fishermen and ɔ-operative societies for installation of engines ts, running of ice and cold storage plants and ɔcuring new boats and nets etc. The total : of such loans exceeds Rs. 3,000,000 and es granted for mechanization of fishing craft tallation of ice and cold storage plants amount 380,000.

ɔmbay, 50 out of 78 Fishermen's Co-operative es are affiliated to the Central Co-operative zation, which markets, on an average, Rs. worth of fish per annum. The Co-operative es have been of grant benefit to fishermen for providing loans and subsidies for purchase of costly items of equipment and procurement of many essential items such as cotton twine, hemp twine, sail cloth, fish hooks and other fishing requisites for supply at reasonable rates.

In Madras, over 250 Fishermen's Cooperative Societies have been organised, most of which are credit societies, but they also supply food grains, yarn and fish hooks. There are a few societies for fish marketing, fish curing and net making also.

In Orissa, two major schemes on co-operative lines were taken up for development of marine fisheries and marketing of fish. There are 21 societies dealing with fish worth about Rs. 3,200,000. The societies meet the requirements and daily needs of fishermen in the coastal area and grant loans to tank owners for reclamation work in connection with fish culture.

In Saurashtra, 17 Co-operative Societies distributed fishery requisites worth Rs. 280,000 during 1954. It is planned to organise a Co-operative Central Fish Marketing Organization for the State.

Travancore-Cochin has 145 societies which are mainly credit societies. Efforts are being made to organize Fishermen Co-operatives in the States of Andhra, Bhopal, Himachal Pradesh, Kutch, PEPSU and Punjab.

The Norwegian Aid Community Project, initiated in 1953 in Travancore-Cochin has taken measures for the improvement of health and sanitary conditions of the fishing community in the project area by providing preventive and curative medicines, latrine and protected water supply etc. About 100 fisherwomen were also given training in tailoring.

In *Indonesia* a very great deal of socio-economic work is in hand, which is a logical extension and development of that work which has occurred previously. A summary of the experience in this territory will doubtless be of value to others, since the foundations were first laid with the establishment of an organized fish auction in 1912 at Tegal in Central Java. The success of the socio-economic programme in Java has been based on the development of fish auctions run by Co-operative Societies. The programme has been extended to the other islands of the Indonesian Archipelago. Fish auctions previously controlled by local governments or by the Institute of Sea-Fisheries, were after World War II gradually transferred to Fishermen's Co-operatives, although where circumstances demand, the auction still remains in the hand of the local government. Privately organised fish auctions are prohibited.

The socio-economic aspects of fish marketing in Indonesia are dealt with at length in Technical

Paper IPFC/C55/TECH 45(SS) presented at this Session.

In *Japan* the Government reports that the most vital socio-economic problem is the repeated capture by foreign ships of Japanese fishing boats, which is seriously affecting the production of fish. To meet this, a fisheries agreement was signed in April, 1955, between Japanese and Communist Chinese fishermen. Though this was not done on a Government-to-Government basis, it is believed that it will help towards a solution in the China Sea area, because the agreement, good for one year, provides that both Japan and Communist China take steps for :

(1) conservation of marine resources.
(2) the establishment of six fishing areas for safe operation by Japanese fishermen in the offshore waters off the China coast.

The second problem is the depression in the export trade in marine products. The Japan-Communist China private trade agreement signed in May this year, is expected to improve the export trade of marine products.

The accidental damage to Japanese fisheries, by the Hydrogen-bomb experiments at Bikini atoll, has also had a depressive effect on the fishing industry.

In *Pakistan*, a Socio-economic Section has been established in the Central Fisheries Department at Karachi. In order to increase production, it is essential that :

1. The fishermen may get their requirements supplied at cheap rates and on easy terms.
2. Loans become available to fishermen, to purchase their requirements, to maintain them during the off-season and to free them from their perennial obligations to the money lenders.
3. Fishermen's Co-operatives organize fishing units and sales depots.
4. Markets be created abroad as well as at home.
5. Societies should start on a small scale and expand gradually.

Adopting the above principles, the Section is supervising the operations of a Fishermen's Co-operative Society. Materials available locally are provided for the fishermen at cheap rates, and items which are not available locally are procured.

Active co-operation and guidance of the Government is important, since the main cause of failure of Co-operative Societies has been that most of the members were illiterate and were exploited by a few unscrupulous educated persons.

In the *Philippines* foremost among the socio-economic problems affecting fish production rooted in the employment of clandestine meth fishing, such as the use of explosives and poi substances. Use of these methods grew to al proportions immediately after the terminat World War II. The pernicious impact of t of these methods has telling effects upon the try and is looked upon as one of the probable r behind the depleted status of the resource w apparent in the fact that while the factors c duction at work in the industry has increase the postwar period, there have been no comm ate returns to fish production.

To solve the problem, the Bureau of Fis with the co-operation of all police forces in the try, has embarked upon more vigilant police together with the proclamation of the last w October of each year as a Fish Conservation when radio talks, lectures, contests etc., stress minds of the people the importance of measu practices for the wise utilization of the resources. Posters and publications depicti evils attendant on the use of clandestine methods are put into circulation. An X-ray ratory has been set up in Manila for exa fishes suspected of having been caught explosives. Findings in this laboratory ar taken as *prima-facie* evidence in court and on cases have served as the basis for the convictio number of fishermen apprehended for fishin explosives.

Another problem rests with the low incom of fishermen. In a survey of some fishing v it was found out that on the average, a fish receives P500 (US $250) a year as his incom fishing. It is only through subsidiary inco other occupations that a fisherman can maint family which, on the average, numbers abou members. To improve the low income l ' Minimum Wage Law ' has been passed.

High cost of fishery requisites presents a problem. Import control regulations in the try visibly affected the prices of commoditi ported from foreign countries, and most equipment and appliances are of foreign To reduce the high cost of fishery requisit Government has abolished the ' Sales Tax ' fo paid by fish producers.

The preponderance of antiquated gear employed in the industry, shown in the inv list of fishing gear used in the country in accounts for another problem affecting fis duction. Productive returns from fishing co improved by the introduction of modern and e gear.

Government has, therefore, set up several s schools where young people are trained in e of modern and effective fishing appliances. overnment also encourages the importation of fishing experts to train local fishermen in n fishing methods, and a number of longline experts from Formosa were allowed entry e country for this purpose. Technical aid to nd old investors in the industry is also being

imposition of a ban which prohibits trawlers rate in certain good trawling grounds in the rn islands has resulted in overcrowding in rawling areas and this has led to a noticeable in the production per vessel.

e operators of the trawlers affected have taken themselves to shift to another type of gear *basnig* (bag net) when they realised the futility tinuing on with trawling operations, while transferred to more distant fishing grounds, gating the problem of overcrowding and over- to some extent.

hing of juveniles is another problem affect- h production. Since time immemorial, local ien have been using fine-meshed nets for g fish. Concern about the disastrous effects with very fine meshes has been shown since anish regime, but their use persists to the t day.

depletion of the resources due to non-obser- of ' closed seasons ' by fishermen adds to the ld problems that beset the industry. Lack ds, along with lack of personnel to enforce l season ' has rendered orders for the obser- of such seasons ineffective.

need for improvement of the present inade- fish landing places cannot escape notice. ctions for the exchange of fish products occur open with the baskets or trays.

ently, a move is being taken by the Bureau of es towards the approval of a plan to establish operating fish exchange in Manila. This is d to serve as the initial move towards the hment of similar institutions in various c points in the country. The plan includes, other things, the establishment of modern ding facilities, complete with fish handling ent as used in other countries, refrigeration and an up-to-date exchange room. Success scheme, should it be approved, will lead to the hment of other fish exchanges in other parts country and afford a solution to the problems from the lack of good fish landings.

control exercised by fish dealers in the dis- tribution of fishery products has long been a problem. Much of the fish produced by the fishermen is sold to these shrewd dealers at the price dictated by them. Enormous quantities of fish and other fishery products are being channelled to these operators enabling them to bring considerable influence to bear on the distribution system.

Until the idea of establishing co-operatives became popular there appeared to be no means of controlling the influence of these dealers. The co-operative movement has done much in improving the distribution of some agricultural commodities in the country and its eventual entry into the fisheries industry is looked upon to relieve the fishermen from this onerous system of financing.

In the *United Kingdom* territories, the work of the Hong Kong Fish Marketing Scheme continues with no major changes. An appraisal of the mechanization of local fishing craft has shown that the earning power of the owner-operator fisherman has been greatly improved by the change from sail to diesel power for both propulsion and fishing. More time must elapse before it is possible to evaluate the significant factors that have contributed to increased landings over the past five years.

A sampling analysis made by the Marketing Department of 21 fishing vessels of various types, before and after mechanization, indicates that the minimum increase in catch is twice and the maximum four times. Apart from these direct benefits, the provision of large sums of money by both Government and private enterprise for loans at low rates of interest for mechanisation has weaned the fishermen from the traditional sources of loan money, with crippling interest rates. Loan money is fed back through the Fish Marketing Organization which compels the fisherman to market through that organization if he accepts cheap loan money.

An encouraging and important development towards financial independence among local fishermen was the registration of the first Fishermen's Thrift and Loan Co-operative Society in September, 1952. The establishment of this Society was carefully watched by fishermen all over the Colony, who by nature are extremely conservative and cautious in adopting new ideas. The progress made by the first Thrift and Loan Society was most impressive and a total of 20 such societies are now registered.

In the *Federation of Malaya and Singapore* gradual progress is being made over a wide field of socio-economic activities and in the majority of these, the Department of Fisheries operates as the Co-ordinator between a number of Governmental Services. There has also begun a healthy development of community consciousness among fishermen in a number

of areas, associated with the development of elected local, State and Federal Government, where they have formed committees and associations with elected leaders to represent them. The Government Departments which work together at all levels in this socio-economic development, both fresh water and marine, are :

(i) *The Co-operative Department* for guidance and advice in the formation of Co-operative Thrift and Loan Societies and for Co-operative Marketing Societies.

(ii) *The Rural & Industrial Development Authority* which provides funds for Community Development projects and cheap money as loans for craft, gear and equipment. The Authority also provides funds for training.

(iii) *Marine Department* which designs the law controlling all craft and their crews. Provides staff for training and examination in navigation and seamanship for fishermen.

(iv) *Education Department and Surveyor of Ships Department* for training and examination in engine care, maintenance and installation for fishermen.

(v) *The Town Planning Department* which assists in the designing of layouts for fishing villages.

(vi) *The Agricultural Department* with whom all work on fish-culture is closely associated.

(vii) *The Administration* which not only is directly concerned with the overall social and economic welfare of the people, but which is also directly concerned with land administration and utilization and is, therefore, fundamentally concerned with any shore-based installations or work for the fishermen.

With the appropriate co-ordination of Departments, a considerable number of developments have been made in the past two years, covering training of fishermen in navigation and engine care and maintenance ; formation of co-operative societies ; issue of cheap loans for engines, craft and gear and of motor lorries for carrying fish to markets ; building of jetties and roads, and supplying such public services as water and electricity to fishing villages (in such schemes ' self-help ' is stimulated and encouraged). Assistance is given in the design and construction of mechanized craft and here it is worthwhile noting that it is often essential to achieve a compromise between what the fisherman wants and what the principles of good design and sound installation dictate.

In marketing, there have been two major difficulties to overcome ; vested interests and the dishonesty of elected officers of co-operative so which leads to mistrust. It is clear that if the of co-operation is not inherent among the me of a community, a long time is often necess educate them to the value of the principl experience. It is rendered more difficult b fact that there is often traditional competition a village among crews operating different ty gear to catch the same types of fish. Undou the most successful co-operative society in M which combines both marketing and ' thrif loan,' is composed solely of handliners and t —they all think in the same way and the st goods in their co-operative store is of common to them all.

In one area of Malaya, a government org Fish Marketing Scheme has been started on a which will permit of it ultimately passing operative ownership. The Scheme has been s on a pilot-scale, to handle approximately 3 lon of fish per day. The major difficulty has be competition of vested interests of middlemen are doing a great deal to attract the fishermen from a project designed to safeguard the inter the fishermen and the consuming public. It great interest to see how the fisherman lives for and does not worry about tomorrow until it a

In *Singapore* a Fisheries Loans Board has op for a number of years and has recovered the issued amounting to a quarter of a million dollars, plus interest at rates varying betwee and 6%. A mobile engine repair and instr unit visits all the fishing villages, either by r by sea and attends to engines, giving instruc the same time. A charge is made for materia spare parts.

In the fish culture field, both brackish and m courses at all levels from Government staff t agers have been held throughout Malaya, inc the inmates of prisons.

In *Sarawak* there is a successful co-op marketing society for handling Government and another society among the drift net fish

In *Brunei* there is a scheme for providing lo fishermen which is growing. In North there are no activities in hand at present, bu are under consideration.

3. *Advances in the Development of Fish Ma and Distribution ; Development of Consu of Fisheries Products to Improve Nutritie Effect of Consumer Tastes for Non-cus Products and Means of Influencing then*

In *Burma* two fishmarketing co-operative been operating, one in Rangoon and one in M

As stated above, one of the major problems to rcome in Burma is to accustom the popu- to sea fish, since traditionally they have eaten vater fish. A programme of cookery demon- and propaganda by advertising, is in hand, eve this.

Ceylon the marketing and distribution of fish nded over to an autonomous body, the Ceylon rative Fish Sales Union. This Union has up several ' fair price ' stalls in various parts City of Colombo with the intention of pro- fish at reasonable prices to the consumer. The refrigerated display cabinets has been started.

ndia the main approach has been the intro- of equipment to improve the physical aspect keting. With TCA and FOA aid from the States, ice plant, quick freezing plant, rating plant and refrigerated transport have imported and are now operating. With the ion of hydro-electric power and the manu- of refrigerating machinery within the coun- siderable progress is expected.

ndonesia the accent has been on the extension well-established marketing organisation, which of a phased though comprehensive approach whole of the economic problems in the fishing y, to those parts of the Republic where the ations are not yet functioning. A great deal is being done in this respect. [(See Tech- aper IPFC/C55/TECH 45 (SS)].

pan there is only one matter worth special for the period. In 1955, broadcasting s are being provided for 17 fishermen's co- es with national funds and these facilities spread widely in future years. It is expected is will do much towards establishing fair ions in fish marketing, in the stabilization of es and the improvement of fish production. ner problem is receiving attention, the pre- of waste in the preparation of human food. experimental level satisfactory pastes have ade from whole fish, but so far, consumer s not been met.

kistan there are no advances to report other e comprehensive planning made in the sec- ling with socio-economics of the industry.

e *Philippines* the most notable development n in the marketing of ' patis ' (fish sauce). of keen competition among producers, they opted various means of presenting their pro- To-day, patis is sold in attractively labelled with brand-names and trade-marks.

role played by air transport in fish distri- has become increasingly important. Iced fish and shrimp from fishing centres in the Southern Islands are transported regularly by air to Manila. During the season, the fry of *Chanos chanos* are transported in earthenware pots in millions by air to Manila. Although air-freight rates are high, the price differential between points of production and consumption is high enough to enable bulk dealers to ship by air at these rates and still make an adequate profit.

There has been a significant increase in the use of ice and its manufacture, which has made it possible for fish landed in the Southern Islands to be distributed over wide areas. An improvement in the roads has further contributed to this progress.

A widespread and comprehensive campaign to increase the consumption of fish and fish-products is in hand. Pamphlets ; posters ; training in home economics ; cooking classes ; recipes in local newspapers and magazines have all been used to improve nutrition. While it is not yet possible to evaluate the results, it is clear that the campaign is having a marked effect, at least among educated groups.

In the *United Kingdom* territories, and with special reference to *Hong Kong* the main accent has been on consolidation of the well-known Co-operative Marketing Scheme. One technical advance has been made which assists in marketing, which is the production and storage of dried fish in humid or raining weather. This is done by machine drying, which is hygienic, independent of the weather and reliable ; it dries the fish at a temperature of 80°F. and a relative humidity of about 50%. Since salt fish absorbs moisture at a relative humidity greater than 72% and Hong Kong humidities are rarely below this figure, the mechanical methods prove of great advantage. Where as in Hong Kong, the retail market is close at hand, dealers tend to dry fish inadequately. For export or long storage it must be well dried. It would be interesting to know from Hong Kong, of the economic advantages gained and the costing of this method.

In the *Malayan* territories some progress has been made with the icing and packing of low grade fish (Clupeoids ; Scombrids ; Lethrinids) for distribution over long distances and marketing. Where it has been customary to salt and dry the low grade fish, it is now becoming important to feed inland population centres, where labouring classes predominate, with cheap food. The use of insulated metal containers which hold either 25 or 50 kilograms of fish and ice, are strong, not too heavy for two men to handle and can be transported by road or rail, are beginning to prove successful. The insulant used and found most successful is a material known as ' ONAZOTE ', which is vulcanized blown rubber. Fibre glass has been tried, but settles with

the vibration incurred during transport. It is essential that the equipment be relatively cheap and stable. In addition, considerable progress has been made with the mechanical production of ' belachan ' or shrimp paste under clean and hygienic conditions. The use of the new plastic sheet has been encouraged for packing and the adoption of trade marks, to indicate the well-prepared product which is now being placed on the market in a clean, hygienic and attractive packing.

In *Kelantan*, in the North-east of Malaya a comprehensive marketing scheme has commenced which is to handle and distribute the fish over the whole area of the State, to provide the fishermen with producer goods and essential foodstuffs at economic rates, and to encourage thrift. The Scheme is meeting with opposition from vested interests and the suspicion which confronts such schemes in any part of the world is particularly difficult to overcome in backward areas, where the fishermen are largely illiterate and inarticulate, and from bitter experience have found that only the fittest survives.

4. *Development of Fisheries Extension Services*

In *Burma*, training courses in fresh-water fish culture are conducted, the trainees being supported while undergoing training. Plans are in hand for the recruitment of foreign and local personnel and the procurement of vessels, equipment and materials for the training of master fishermen in modern fishing methods.

In *Ceylon*, extension work has been done to promote the utilization of inland bodies of water and to encourage freshwater fish breeding in tanks, ponds and rice fields. Lectures are given in simple language explaining the cultural methods and the preparation of ponds and tanks. Leaflets in the vernacular languages and film shows are conducted to illustrate the *modus operandi* and benefits that accrue from farming fish. This has had encouraging results.

In *India* a realistic approach has been made. Fisheries research in this country has been only of recent origin and the results achieved, which are of practical value, are very few in number. A scheme of research was initiated jointly by the Central Fisheries Department and the State of Orissa. The former confined themselves to the basic problems and whatever results were achieved, were taken to the fishermen by the State Department. The results have been surprisingly encouraging. Based on this experience, the Central Fisheries have now established extension units and this aspect is given prominence in the Second Five Year Plan At present, the scientist has little to offer the fisher man in the field and considerable progress has to be made, not only in solving the day-to-day pr but in carrying the solutions to the fishermen.

In *Indonesia* as in other countries, an atte being made to increase fish production in the country. This is very urgent, because of th shortage of animal protein for the people collective fish production from sea and fisheries at this moment gives an average pe fish consumption per year of about 8 kil only.

It may be said that the Indonesian people consumers of too small a quantity of animal p To change this, fish production has to be in as quickly as possible, together with an incr the production of meat. This aim is not an sibility. There are still so many unexploited grounds and land suitable for fish culture, s cultivable waters still waiting for diligent ha many fishery activities which can be impro get higher yields, so many unknown factors be investigated by sea and inland fishery labor But the most important factor is contact w people themselves, i.e. the fishermen, fish f and others, who must be properly equipped the best advantage of the resources.

In order to attain this end, it is necessary attention not only to fishery projects alre hand, but also to those which still have to structed or to be discovered. Therefore tw ways have to be followed: firstly, finding structing new fishery areas, including new m new cultivable fish species, new kinds of equ etc., and secondly, improving fishing and vation methods applied by fishermen and farm

A description of the Inland Fisheries Ex Service in Indonesia is given in Technical IPFC/C55/TECH 43 (SS) presented at Session.

In *Japan* the establishment of a service to scientific knowledge to the level of the fishern fish farmers was inaugurated in 1953. The sion services of the Government are conducte two headings : sea-fisheries and agriculture.

Certain boats are selected from among all boats in a designated area and these are des as ' centre boats ' by both local and central ments. The activities with which ' centre are concerned, include the following fishing m gill nets, lift nets, drag nets, longline and h line fisheries. Machinery and gear necessary improvement of these fisheries are provided the centre boats by the Prefectural Fisheries mental Station, and experts of the Station board these boats as extension advisors to gi nical guidance to the crew. Fishing boat

he centre boats, are formed into groups by of fishery, to be given help and guidance h the centre boats.

type of machinery and gear provided by the for this purpose are ; fish finders, binocular copes, colorimeters, water samplers, rever- hermometers, plankton nets, electric harpoons nthetic-fibre fishing nets.

is all in addition to the results achieved by training at the various schools and colleges an, which has 1½ million fishermen. There schools in which ordinary education as well eries courses are conducted, and 29 Fisheries Schools. There are five Universities with s in Fisheries for a major degree and seven rsities which incorporate Fisheries with Stock ng and Agriculture. Finally, there is Tokyo rsity of Fisheries which consists solely of the of Fisheries.

the *Philippines*, separate and independent s extension services are conducted by the of Fisheries and the Bureau of Agricultural ion Service. The Bureau of Fisheries has the omprehensive programme, covering all phases industry, while in the other Bureau, there are atters pertaining to fish farms.

ough lectures and demonstrations in the field, ic knowledge in the construction and use of fishing appliances and mechanized equip- s brought within the understanding of fisher- Where lectures and demonstration work nadequate, they are advised to take up courses of the fisheries schools in the country.

pecial request to the Bureau of Fisheries, or specialists are assigned to interested to help them organize their project, train nen, construct or rig their vessel with new tc. Publications dealing with developments ndustry are printed not in English but in the ular languages.

nsion service for fish farmers includes among hings, the assignment of experts to help construct ponds, to teach them proper fish procedures, and to inform them about the requirements that have to be met if their are to be successful. Since the number of that could be attended to by experts is pamphlets are distributed in English and the ine languages.

Bureau of Agricultural Extension Service is ing a successful extension service to farmers. xtension workers who have previously been in the Bureau of Fisheries, they have con- immensely to the growth of backyard fish farms in the country. Like the Bureau of Fisheries, the Bureau of Agricultural Extension Service also disseminates information through printed articles.

In *West Pakistan* dissemination of fisheries knowledge to the level of fishermen and fish farmers is done through film shows depicting the utilization of waste waters by stocking with useful varieties of fish ; its capture and marketing, revealing the statistics and comparing it with other crops.

Other means adopted are radio talks, leaflets, articles, notice boards at important places illustrating what to encourage and what to discourage in regard to Conservation, Development and marketing of fish. Exhibitions are held where live fish of various species are exhibited along with charts and maps imparting easily understandable information.

More useful is the demonstration method. Parties are taken to the fish farms and netting of fish is done in their presence to show the disparity in the yield of fish crops under scientific fish culture as against haphazard cultivation.

Under the village-aid programme, ponds in the Punjab are being selected. The Government of the Punjab is to receive American aid on extension work, which will include fisheries.

In *East Pakistan* under the Agriculture Extension Service, fisheries staff has been delegated to train the Officers of Agriculture, Co-operation, etc., so that they in turn may help the fish culturists. Tilapia was introduced in East Pakistan in 1952, but it was washed out owing to floods, except at Ghaibanda where it is thriving and the fingerlings are being distributed to the farmers. Carp fingerlings are also being supplied.

In the *United Kingdom* territories, *Hong Kong* has nothing to report. In the *Federation of Malaya and Singapore* extension work is carried out by Fisheries Officers and Fisheries Assistants. The fields covered in the past two years have been :

(*a*) *Sea Fisheries.* The design of motor boats, the modification of traditional craft to take inboard engines, and the installation of engines. The procedure adopted is for the boat owner or prospective boat owner to approach an officer of the Department and for them to discuss the fisherman-boat-owner's needs. Then together they visit the boat-builder and the needs of the fisherman are interpreted to the boat-builder in terms of good design and engineering practice. Designs are drawn, models are used and good craft demonstrated. In addition, craft have been built by the Department and lent to

fishermen in order that they may assess the principles, in practice.

In the icing and packing of fish for distribution, demonstration has been given of the value of mechanical ice-crushers and the production of crushed ice of varying grades to suit different sizes and types of fish. The value of good, cold, hard ice has been expounded and satisfactory types of insulated containers demonstrated for long-distance haulage.

Echo-sounding surveys of the sea-bed have been made to indicate to the fishermen areas where banks occur, so that they may operate handlines, longlines and portable traps to advantage. Marked improvement in local production of certain types has resulted.

(*b*) *Fresh-water Fisheries and Fish Culture.* Demonstration in the field on pond construction and land survey; construction of dams, sluices, and canals; stocking, feeding and rearing methods are carried out by Fisheries Officers, for those embarking on or developing fish culture techniques. Then a series of practical courses have been held for Assistant Administrative Officers and for Agricultural Assistants based on existing farm ponds and paddy fields. Instruction in the vernacular has been given to village headmen, advantage being taken of school holidays to hold classes in schools, these are followed up by the distribution of illustrated instructional leaflets and buses are chartered to show the trainees successful fish culture systems. Demonstration is always accompanied by detailed explanation. Fish culture courses have been given in prisons, in three of which there are now fish ponds maintained by the prisoners, serving both as food supply and instructional units.

5. *The Significance of Fish Culture as an Integral Part of Rural Economy.*

In *Burma*, fish from freshwater has traditionally been more acceptable to the consumer than sea fish. However, it is only recently that all the problems associated with fish culture and its practice by the inland farmer as a means of adding both to his diet and his income have been appreciated by the Government. With financial and technical aid, construction of fresh-water fish ponds, to be operated later by co-operatives or village committees, has started.

In *Ceylon*, fish culture in rice fields is now carried out at two Agricultural farms, to se demonstration units for farmers to try in the fields, and this has already been taken up by number of rice farmers. A course of train officers in inland fishery techniques is in pr under Dr. S. W. Ling, F.A.O. fish culturist. Burma, fish culture is new to the rural scene is too early as yet to assess its significance rural economy.

In *Japan*, widespread fish culture is dec since productivity in that country is low. I tribution to the rural economy as a whole ha comparatively small, except in the case of e trout culture. However, the role which fish has played for over a thousand years in the economy, as an important source of protein fo cash in areas remote from the sea, must not counted.

Some 97% of the total management units ar private enterprise, and the number of manag units and the total area used for fish culture s declining trend. This indicates that the prod of fish by culture operations has already reac economic ceiling and in the present situatio low productivity must be assessed against th funds needed to develop fish culture facilities

Despite the unpromising future for fish cul a general practice in Japan, the culture of locked trout to meet an export deman progressed.

Year	*Total Production*	*Volume of*
1952	429 tons	135 t
1953	466 ,,	164 ,
1954	827 ,,	274 ,

Nagano and Yamagata prefectures hold th in trout culture, and reap a maximum inco Y4,000,000 and Y1,850,000, respectively.

The culture of fish in rice fields is declinin

	1951	1952	
No. of households engaged in fish culture in rice-fields	143,000	136,000	1
Area of rice-fields used	21,320 acres	18,860 acres	17, 22
Production for food	1,538 tons	1,163 tons	1,013

This declining trend is in spite of the of increased rice harvest and the high price f by the fish which is produced without extr or labour. The value of fish is estimated Y4,000 per acre per year. The reasons f decline are the increasing discouragement peasant farmer through loss of fish from theft

recent introduction of chemical manures ecticides as part of rice cultivation. How- ıe importance of fish culture in rice fields ıctly shown by the fact that about half of ıl production of carp in Japan comes from elds.

Philippines, the virtual absence of irrigation , precludes the culture of fish in rice fields, ere irrigation projects are being undertaken Government, fish culture as a part of the onomy will be incorporated.

culture in ponds is most important and is n the milk fish, *Chanos chanos*. A measure gnificance of this industry may be appreciated ıe following figures. As of December 31, total of 100,097 hectares of fishponds were l principally for the cultivation of *bangos*, ıtating a capital investment of US. illion. Production from these ponds is d at 35 million kilograms in 1954 and te about 11% of the total fish production year.

on account of its importance to the economy e Philippine Government, through the tation and Finance Corporation, instituted lized system of financing to accelerate fish- evelopment. It was due to this agency hin the five years 1950 to 1954, some 27,000 of idle swamp land were converted into ve fishponds. This continues with in- tempo.

dia the only source of water in the villages lo not have any access to rivers is still in ses the village tanks. In addition, during t 50 years on account of indiscriminate tion of embankments in the form of rail- oads, irrigation canals etc., a large number ıps have developed which have been not tally unproductive, but have contributed al unsanitary conditions and diseases, parti- nalaria. In fact, the engineers are now realis- before any embankment is laid precautionary s against malaria has to be taken in advance, ortunately this idea has not been of much application. Experiments conducted in ıave conclusively shown that large swamps g from 50 to 1,000 acres may be converted ntific fish farms and yield good results if with good quality carps. Almost each as a swamp of its own and a number of small arying between 5 to 7 acres. According to ent rate of production, which is very low, gers may expect about 50 maunds of carps t Rs. 3,000 per year provided the tanks ed with fish every year.

Until now, there has been no suitable indigenous variety of fish which breeds in tanks and shows quick growth. Exotic species like Tilapia, Gourami, etc., have given encouraging results. With improved cultural practices it is not impossible to get 10 maunds or 820 lb. of fish per acre, which means that a village may expect 120 maunds of fish per year and a monetary income of Rs. 7,200, in addition to which there will be less malaria. Considering these facts the maximum stress has been laid in the first Five Year Plan on development of inland waters and now practically every State is laying great emphasis on this aspect. It has now been generally agreed that the village tanks should be the resonsibility of a village committee which will take up fish culture and will have its officer trained in fish cultural practices.

Indonesia is an agrarian country and the means of subsistence of about 80% of the people is agriculture, which includes fish culture. This fish culture is most important, and has been practised for a very long time. Even in the 13th century, regulations were enacted to protect against theft fish culture ponds, which were mostly owned by the nobility as a pastime. Brackish-water ponds were first constructed in the 15th century, starting with brackish-water ponds of Gresik (East Java). About a century ago (1860) the Government propagated fish culture to the people, beginning in West Java. The religious leaders played a big part in extending fish culture, because at that time they were the persons who controlled the water supply.

It will therefore be seen that fish culture has been an integral part of the rural economy of Indonesia since very early times.

The outstanding economic aspects of this special type of rural activity are described at length in Technical Paper IPFC/C55/TECH 46 (SS) presented at this Session.

Pakistan has nothing to report.

Thailand has nothing to report.

In the *United Kingdom* territories, the problem in *Hong Kong* is essentially how best to use land under intensive production for the best economic return, and appropriate land use is one of the guiding principles in government policy. In these special circumstances it has been decided to concentrate on pond development in suitable areas for the culture of carp species, (an expansion of long established practices) and to give special attention to comparatively large areas of brackish-water land for the raising of grey mullet in association with duck raising and the growing of varieties of rice which tolerate salt.

Experimental work in Hong Kong has been confined to three localities and to one species—the common carp—in relation to fish culture in rice fields. It is believed that carp raising in rice fields is not suitable for the average Chinese peasant rice farmer in the Colony, because

(1) Individual holdings are small, often less than one acre and the whole area is required for rice and/or vegetable production.

(2) Under normal conditions, water supply is barely adequate for rice culture; the provision of higher bunds to allow of fish culture is too costly for peasant farmers, and sufficient water to raise fish is not available in many areas over the growing period.

(3) Two rice crops involving about 120 days each for maturation necessitates the provision of holding ponds: in many areas land cannot be sacrificed for this purpose.

(4) Without adequate bunds and traps many fish are lost during periods of flooding.

(5) Even under ideal conditions, losses of fry are considerable.

It will be appreciated therefore, that in Hong Kong, by comparison with other South-East Asia territories, there is nothing casual about the economy of fish culture, but it is carefully planned on an intensive scale, with research following up established practice to improve the yield. The following are the four main lines of investigation undertaken by the Fisheries Research Unit of the University of Hong Kong.

1. Stocking densities of compatible species.
2. Growth rates and productivity, in relation to artificial and natural feeding.
3. The environment provided by the ponds.
4. Parasitism and disease.

In the *Federation of Malaya and Singapo* culture is practised in two ways:

(*a*) in rice fields.

(*b*) in ponds, fresh or brackish.

(*a*) Fish culture in rice fields provides an a to the diet of the cultivator and in those areas are fully irrigated to a depth of between 15 centimetres an important additional cash There are 360,000 hectares of rice land und cultivation, all of which produces fish. C total 45,500 hectares may be classified as the irrigated areas and from them, an estimated tons of fish per annum are produced as a cas for salting and drying on an industrial scale. the other areas, comprising the balance of th area under wet rice, there is a spasmodic proc of fish marketed both fresh and dried, b limiting factors of water availability and wate affect the magnitude of this industry.

(*b*) Fish culture in ponds is promoted thro the country as a factor in the mixed economy agricultural peasant. Nowhere is there a fis which provides the sole means of livelihood owner. The principle upon which such po operated, is to provide the owner with a cash primarily and secondly to enable him to ob additional protein supplement to his diet. now firmly established that with proper manag under favourable environmental circums the fish pond is an economic unit which ca than earn its keep, provided it is associate stock and/or poultry (to fertilize the wate fruit trees (on the banks and mulched with the from the ponds) and the stocking and har programme is carefully planned.

It is estimated that from all sources, a mately 22,500 metric tons of fish are produ fish culture methods, as part of a mixed agri economy. Approximately 385,000 peop involved.

here has, during the period since the Fifth been a notable quickening of the interest y most Governments of the Region in the as a source of food although there are still wo instances where no steps have yet been establish a competent government authority rage the development of the industry.

his is particularly true in the attempt made, without support from various sources of id, to explore the feasibility of introducing r, more costly types of non-indigenous gear s trawlers, longliners, purse-seines, gill- . While it is still too early to attempt an evaluation of these new methods, it may that the results have varied from the firm ment of successful commercial operations lete failure in a few cases.

egative results must not, however, be con- is a total loss, since they point the way to nore profitable activities. Moreover, the uccess is not always attributable to the non- ty of adequate natural resources or to deficiencies in the fishing method itself, ifficulties encountered in training personnel, oming procedural and financial obstacles in ent itself, or in creating a consumer demand esome but unfamiliar products.

onsiderable advances have also been made eld of inland fisheries, more especially in uragement of fish culture activities.

is probable that the field in which most to be accomplished is in the improvement nditions prevailing in the small, subsistence at isolated points along coastlines and rivers, ere is still much hardship due to over-ex- e of effort for too little return, due to capture methods, lack of management of which have been intensively overfished for and lack of proper transportation, handling, g and marketing practices.

oreover, too little is still known about the f the resources on which the fisheries are l the degree to which fishing has reached or e point of economic return and, conversely, extent fishing efforts might be intensified langer of depletion.

is is especially true in the case of certain such as *Rastrelliger*, Hilsa and the Sardines, parently suffer from cycles of good and bad ether of abundance or availability, it is not yet clear. Certainly the ability to predict these favourable and unfavourable seasons would relieve the industry of the perennial fear of disaster and would permit the diversion of man-power to other fishing grounds or methods, or alternatively into non-fishing activities during the bad years.

8. One of the problems which has beset the fishery industries of the region and which is receiving more attention from Governments is that of distribution and marketing. It is becoming increasingly apparent that a greater return from the sea has in the past often been hampered by low returns to the fisherman and high prices to the consumer due to improper practices in the fields of marketing and financing, coupled with dangerously low economic conditions and nutritional standard; fluctuations in catch which might be cushioned not only through the diversion of fishing effort as suggested above, but also by means of improved storage and handling; by proper distribution to inland areas; and through the education of consumer taste to accept unfamiliar products. These problems are being attacked at all levels, e.g. government loans and subsidies; government fishing operations (which should, however, probably in most cases be entrusted to private operatives so soon as new fishing methods can be properly demonstrated and financed); encouragement of co-operative effort, including capture, marketing and supply of materials; building of cold storage plants, properly organized and hygienic marketing premises; adequate transportation to inland areas; establishment of quality standards both for home consumption and export, etc.

9. In *Burma*, fish landings are estimated to have been of the order of 46,000 metric tons as against the last report of 43,200 for 1950. It is certain, however, that this figure would be very greatly increased if subsistence fishing were taken into account. That there is room for a considerable expansion of the industry is proved by the continuing large importation of fishery products. Two Japanese trawlers continue to operate by arrangement with the Government and produced, 1,127 m.t. in 300 operating days and 670 m.t. in 274 operating days, respectively. Fishing is mostly in the neighbourhood of the Mergul Archipelago and the crew is Japanese, with Burmese apprentices. A Japanese report states that the higher prices available in the monsoon period when river and coastal fishing comes to a standstill will probably decide the economic feasibility of continuing these

operations. All principal fishing equipment comes from Japan but fuel and ice are purchased in Rangoon. For heavy repairs the boats must be taken to Singapore. Technical Assistance is being sought from Canada through the Colombo Plan, for the mechanization of small, indigenous craft. Government is giving assistance to fishermen through fishery co-operatives of which there are at present 844, both in the way of loans (about one million kyat to date) but also in producer supplies at subsidised rates. Fish culture is being encouraged both in government experimental stations and at village level and training courses are being conducted. An F.A.O. expert has been provided to assist the Government in 1955. A paper by U Ba Kyaw, 'A Glimpse of the Fisheries in Burma' is presented at this Session. It is, however, apparent that although Burma is a fish consuming country, insufficient attention is still given to fisheries development and there is at present no department within the Government itself concerned with these activities, which are dealt with by the Agricultural and Rural Development Corporation.

10. No information has been received on the status of the fisheries of *Cambodia* although it is known that increasing interest is being evinced in the possibilities of development of the sea fisheries in the Gulf of Thailand. Some concern has been expressed regarding the pressure being brought to bear on the inland fisheries centred on the Great Lake, the Tonle Sap, and there is probably an urgent need for properly planned population studies to determine whether undesirable changes are taking place in the composition of the stocks.

11. According to a *Ceylon* report of the Planning Secretariat on the Six-year Programme of Investment for 1954/1960, local production of fish still only suffices for about 45 per cent of total consumption, the balance having to be imported. It is the long-term objective of the Government not only to make the country self-sufficient in fish at the present level but also to increase the present rate of consumption by providing larger quantities at lower and more stable prices. Allied to this is the aim of improving the social and living conditions of the fishermen themselves, who form about 2 per cent of the gainfully employed population and caught some 24,000 tons in 1953. Broken down in terms of catch per man per year, this represents only half a ton of fish annually, which while fairly representative of subsistence finishing in the region as a whole, can undoubtedly be improved. A determined attempt is to be made to assess the extent of the fishery resources and to ensure that future supplies will not be jeopordized by over-fishing. There is an indication that large quantities of migrant stocks exist in the Indian Ocean beyond the con the indigenous craft and research is proce this project. In this task, considerable a has been given by the fishery biologist pro the Colombo Plan and the work will be c by the local trainees. The Colombo P in addition to the two trawlers previously r supplied 40 marine diesel engines which supplied to the industry on easy terms from a ing fund. Assistance has been received from in determining to what extent existing lo may be advantageously mechanized and fa results have been obtained with the larger the Jaffna area; experiments will now be e to include the mechanization of the *orus* southern and western coastlines. A cons increase in fish from fresh and brackish-wa is also expected and a survey is present conducted with assistance from an F.A.O. Considerable attention is being paid to the ing, transportation and handing aspects insulated refrigerated trucks have been rece gift from Canada and will bring in fish from centres, for which purpose access roads a constructed. A cold storage plant to hold t fish caught in the favourable seasons is bei also with Canadian assistance, together wit products factory, which will probably be over to a board as a commercial undertak modern fish harbour is being constructed at at an estimated cost of Rs. 5.7 million. the comparatively short-term effects of th programmes on the welfare of the fisher Government has launched a scheme for the c tion of 3,250 houses for fishermen at a c million rupees. An illustrated F.A.O. re recently been released on the mechaniz fishing operations in Ceylon, as the outcom termination of the work of the first fishery supplied under the Expanded Technical A Programme. The most outstanding result work is the eagerness of many fishermen engines of their own.

12. The total landings of marine fish in 1953 were 570,768 tons as against 501,8 in 1952. The general conditions of Marine along the East Coast of India seemed to h more or less steady during the past few yea those on the West Coast were extremely owing to wide fluctuations in the landing major shoaling fishes like the sardines and which form the main fisheries of the Wes The Fishery Survey, conducted by the Marine Fisheries Research Station, has i that 1953-54 fishing season for sardines wa the most successful in recent years. Abou tons of fisheries products consisting mostly

lted and wet-salted fish valued at Rs. oo were exported to Ceylon, Burma and untries as against 24,390 tons valued at Rs. oo in 1952-53, and 19,340 tons valued at Rs. oo during 1951-52. The imports during period mostly from East Pakistan d of 3,142 tons of fishery products valued at 05,000 as against 3,664 tons valued at Rs. o during 1952-53 and 4,394 tons valued ,169,000 in 1951-52. During the year under steps were taken to develop both the inland rine fisheries of India. Under the 'Grow Food' Fisheries Development Schemes, tral Government during 1954-55 sanctioned ,000 in the form of grants and Rs. 1.38 as loans to different State Governments. 20 million fry and spawn were collected and during the season 1953-54. The Central Fisheries Research Station continued ations on pond culture, riverine, lacustrine arine fisheries. Considerable improvements en effected in carp nursery practices and the d survival of fry. Experiments on the of Tilapia, separately and in association with cial carps, are in progress to determine the ty or otherwise of its introduction in Indian A substantial programme has been initiated new Indo-U.S. agreement which provides levelopment of inland fisheries, reclamation ps, distribution of fish to the interior areas sport vehicles etc. with an estimated ure of U.S.$555,000 and Rs. 2,834,500.

e marine fisheries, mechanization of indi- craft and the introduction of new powered ve materially yielded more catches by in- the time and area of fishing. In Bombay here has been an increasing demand for diesel engines for fitting in the local fishing erating in inshore waters and 337 such boats were in operation, mainly through d subsidies granted to fishermen by the vernment. Under the U.S. aid programme ines have also been procured for various States and some engines have also been under the Norwegian Assistance Pro- in Travancore-Cochin, which has also con- s experiments on fishing with purse seine, s and longlines, construction of new types and the installation of an ice factory.

ratory and experimental fishing and marine research were continued at the Deep Sea Station of the Government of India at The bull trawling operations conducted two Dutch cutters *Ashok* and *Pratap* lded very encouraging results indicating trawling has very good potentialities in the Indian seas. A private Japanese fishing vessel, *Taiyo Maru No.* 17, worked successfully during the year in some of the more productive areas and landed 488 tons of fish from 31st December, 1953 to 20th July, 1954. Taking the results of fishing from December, 1953 to May 1954, it has been found that the average catch per hour of fishing by *Tairu Maru* was 570.1 lb. against 1,347.4 lb. by *M. T. Ashok* and *Pratap* working as a pair of bull trawlers. During the 1954-55 fishing season *M. T. Ashok* and *Pratap* together landed 177 tons of fish in 5 voyages from 2nd January, 1955 to 5th March, 1955. The two Danish cutters *Sagarika* and *Baruna* also continued to conduct exploratory fishing in the Bay of Bengal.

Efforts to organize fishermen's co-operative societies were intensified and timely loans and assistance in the fishery requisites at reasonable rates were arranged. The State Governments, notably Madras and Bombay, have established some 800 fishermen's co-operative societies.

Marketing arrangements in some of the States were improved. Bombay has recently constructed a fish market at a cost of Rs. 1,600,000. Facilities for ice and cold storage and transport are being provided by the States of Bombay, Madras, Orissa and Saurashtra. Madras has set up two ice and cold storage plants at Calicut and Mangalore. Under the American assistance programme, eleven insulated road vans have been procured for maritime states. The Central Government is taking steps to introduce refrigerated railway wagons for long distance transportation.

A comprehensive study of the different methods of fish curing practices throughout the country has been commenced at the Central Marine Fisheries Research Station, with a view to effect improvements in handling and processing of fishery products.

An F.A.O. naval architect was engaged on designing suitable types of fishing craft for different regions of the coast. In Madras State the results of the fishing experiments with small power boats by an F.A.O. Fisheries Engineer have already attracted the attention of the fishermen who are now requesting these types of boats and gear on reasonable terms.

Investigations on the Mullet (*Mugil parsia*) and fresh-water eel (*Anguilla bengalensis*) indicated that a definite slowing down of growth during the monsoon caused a break in the formation of the circuli on the scales of these fish. Based on the studies of their scales it has been found possible to determine the annual and half-yearly growth increments in the length of these fishes.

13. During the postwar period from 1945 to 1947, *Japan* suffered from dire shortage of food,

including fish. Affected by war damage and fluctuations in the availability of migrating fish resulted in a serious reduction in the annual fish catch to the lower level of 1,875,000 to 2,250,000 tons. Measures were therefore taken to secure the rehabilitation of fisheries production, by building fishing boats and by preferential supply of fishing materials. Since 1950, the fisheries rehabilitation programme has been pushed forward at a rising tempo year after year. Stimulated by the elimination of the restricted fishing ground during the occupation, the high seas fisheries (arctic salmon, trout, and crab fisheries, high seas tuna fisheries, etc.) attained full development and the fish catch in 1953 and 1954 rose to 4,772,500 tons and 4,800,000 tons respectively. In consequence, per capita per day animal protein intake merely from aquatic products in 1952 and 1953 was 10.2 grams and 9.4 grams respectively. This was a substantial gain over that in 1945-47, although in view of the growing population, it has become necessary to raise the fisheries production still further. However, when the number of boats operating fisheries is increased, individual incomes from fisheries will decline, thus resulting in decreases in fishing. The Government has therefore taken steps to reduce the number of trawl fishing boats and their conversion into other fisheries. In 1950 the consolidation was carried out as regards medium trawlers operating on the East China Sea (west of 130°E longitude). Under the five-year programme beginning 1951, small type trawlers (less than 15 gross tons) have been consolidated and since 1953 medium type trawlers (15 gross tons or more) have been urged to convert into power tow boats for towing catcher boats for bonito and tuna.

Of the 2,600 fishing ports deemed important from the national or local economic viewpoint, 450 have been repaired or improved since 1951.

In 1951, the Reconstruction Finance Corporation was replaced by the Japan Development Bank, which has provided capital for whaling in the Antarctic Ocean, high seas tuna fisheries of 300 gross tons or more, and ice-making and cold-storage equipment. Long-term, low-interest loans have also been made available to other smaller fishermen from the Agriculture, Forestry, and Fisheries Finance Corporation. A smaller fishermen's loans guarantee system was also devised by the Government whereby smaller fishermen or fisheries co-operatives and local public entities make their own contributions and their obligations to private banking institutions are guaranteed by the Government.

During the period from 1952 to 1954, fisheries-rights bonds amounting to 17,800 million in face value (U.S. $49.5 million) were delivered to the old fisheries rights owners as compensation for the cancellation of the fisheries rights and these converted into cash were used for the formation fisheries co-operatives and other fishing op

In order to render active co-operation to ternational agreements for conservation of resources, Japan participated formally in th national Whaling Agreements and has abide fully by the restrictive and prohibitive clau July 1954, Japan became the host country International Whaling Convention held at

Although Japan does not participate in th national agreement for fur sealing, she part in the triple conference (the U.S.A., Cana Japan) held in 1952 for ecological study of f Until the formal participation in the Fur Se servation Agreements, fur sealing operations high seas are prohibited. The study of foo of fur seals in Japanese waters were undert the Government of Japan in 1953-54. The ment has dispatched boats every year since make the study of the resources of arctic trout and crab.

Various research and investigations hav carried on since 1950 under the leadership national fisheries research institutes for t servation of aquatic resources and expansion fishing areas. Great expectations are held overall research projects on the Tsushima Current (from the East China Sea to H through the Sea of Japan) carried on under year plan beginning 1952. The study of sourses of sardine, mackerel, demersal fish, mackerel, pike, and of migrating squids are progress under the leadership of these insti

Since 1951, government fisheries statistics have been stationed at the main fishing throughout the country. Based on the ana these statistics, it is decided whether or not servation of aquatic resources is well maintai what further measures may be required totalling nearly 483 tons caught by about 85 boats had to be discarded, having been ir as a result of hydrogen bomb experimen ducted in the Marshall Islands in 1954. fishing is one of the most promising opera postwar Japan, the impact on Japanese fis quite serious, especially due to the loss o grounds by setting up off-limit areas to tuna boats and because of the increased time e in reaching the fishing ground, owing to the n of avoid ng the prohibited areas. In addit purchase of tuna and other fish showed a su decrease, resulting in lower prices and fish came to a complete standstill. The Govern Japan in May, 1954, dispatched boats to st impact of bomb explosions on the aquatic r

Bikini area. The data collected by the experts v under compilation.

In *Netherlands New Guinea* there is a striking nce between the Northern and Southern The water masses along the north coast are of an oceanic character and, situated just of the equator, are regulated by the equatorial s. The mouths of some great river systems vith some extensive reef areas of the Geelvink d the Radja Ampat Group, are the richest grounds in this area. The continental shelf ly very narrow, extending only a few miles out near the mouths of the afore-mentioned The pattern of the south coast is largely ced by the numerous river systems emptying he comparatively shallow Arafura shelf. gh the waters along the coastline are rich in d crustaceans, little is known of the produc- f the off-shore waters.

fishing industry, which is chiefly at a sub- e level, employs very primitive methods. It eved that the total yearly fish catch is bet- 2,500 and 3,000 tons. The growing quan- f dried salted fish indicates that the produc- gradually increasing. In 1954 an estimated t of 600 tons of canned and frozen fish and ns of dried salted fish was imported into the ies. In 1954 a three-year programme for pment of the fisheries was started. Explo- and experimental fishing was carried out 1954 with two Dutch-built steel cutters, one ch is chiefly equipped for the exploration of al trawling grounds, while the other will be r the exploitation of the pelagic fish stocks in ea to satisfy the immediate demand for fresh the north coast and the exploration of the re fishing grounds on the north and west During 1954 a considerable area was covered trawl cutter and several suitable trawling s were found along the north and west coast territory. Indigenous crews were success- rained in trawling operations, engine main- e and net mending and construction. The oat also conducted reef fishing in the Geelvink nd Radja Ampat Island area. Experimental was carried out with three small motor es in the shore waters of the Humboldt and nk Bays. The results of these experiments rm the basis for future development schemes fishing industry of the territory. Meanwhile, ension service of the Fisheries Division is built up, so as to introduce the preliminary and findings of the investigations into the sheries. As a first step of mechanization, small air-cooled inboard diesel engines will be installed in native fishing craft. The first of these units will be ready for testing in the middle of 1955. During the latter part of 1954 an ichthyological survey was started of the fishes and crustaceans of the inland waters of Netherlands New Guinea. This survey was made possible with the financial aid of the South Pacific Commission.

15. No information is available on the fisheries of *Australian New Guinea* and *Papua*. However, the check-list of New Guinea species has been revised, as a result of the investigation of the *M. V. Fairwind* during 1948 and 1949. The number of species of fish known from Australia is thus increased from 821 to 1003.

16. As regards the fisheries of the *Commonwealth of Australia*, the Barramundi (*Lates calcarifer*) is the only fishery of economic importance in central and northern Queensland waters and in the Gulf of Carpentaria, but catch statistics revealed a noticeable decline from a peak figure in 1947, related to illegal fresh water fishing and the taking of undersized specimens. A further 900 fish were tagged during the year. The return of ten tags confirmed the previously held hypothesis regarding very rapid early growth rate and catadromous behaviour. Morphometric studies revealed differences between stocks inhabiting the east coast of Queensland and the Gulf of Carpentaria and between fresh (i.e landlocked) and salt water inhabitants.

The most important species in the Australian fish catch in 1953-54 was the Australian Salmon (*Arripis trutta*) with a record yield of 11.4 million pounds.*

The commercial catch of Barracouta (*Thyrsites atun*) was 4.3 million pounds (beheaded and cleaned) in 1953-54 was the lowest since 1941-42. The adverse conditions of the previous three years recurred in Bass Strait and on the east coast of Tasmania.

The overfished New South Wales Tiger Flathead (*Neoplatycephalus macrodon*) trawl fishery remains at a low level. One of the two steam trawler companies has ceased to operate and the shipwreck of two trawlers has reduced the fishing effort, which is however still estimated to be considerably in excess of the optimum.

The 1954-55 season for Southern Bluefin tuna (*Thunnus thynnus maccoyi*) in New South Wales opened very promisingly. However, because of falling prices overseas and lack of freezer space, catch quotas were enforced and only about 550 tons were taken.

* Annual Report, C.S.I.R.O.

Commercial net fish were abundant in Lake Macquarie in New South Wales, while ground fish such as Flathead and Whiting are relatively scarce. There is some indication that black bream are overfished.

A study of the movements of the Sea Mullet (*Mugil cephalus*) within an estuarine system shows that the mullet school persists as an entity, although some emigration from (and presumably immigration to) the school takes place. Considerable range in behaviour is displayed by individual schools. Evidence suggests that most adult fish participate in the spawning migration only every second or third year.

The data on the biology and catch statistics of Yellow-eye Mullet (*Aldrichetta forsteri*) are at an advanced stage of analysis in Western Australia. There is evidence that the yellow-eye mullet of Victoria and Tasmania are racially distinct from those of Western Australia.

The total catch of the Western Crayfish (*Panulirus longipes*) rose to 10.3 million pounds in 1954. Plans were made for an investigation of the fishery of the Southern Crayfish (*Jasus lalandii*) in Tasmania where the rate of catch, although not the catch itself, is falling in most areas.

The Tiger Prawn (*Penaeus esculentus*) was taken in fair quantities in Western Australia.

It has now been found that the almost universal absence of 0+ age-group in samples of the Pearl Oyster, *Pinctada maxima*, is due to the inability of divers to see them. Beds on which no 0+ group oysters have been seen in the past three years carry plenty of the 1 and 2+ groups. It is now possible to determine accurately the state of maturity of pearl oyster gonads by histological examination.

17. Fish landings in *Pakistan* have shown a downward trend of about 10% due to shortage of raw materials for fishing and also failure of the thrimp fisheries on the coast of West Pakistan, due to bad weather. Export of fish products for 1954 were: West Pakistan (principally cured fish) 7,600 tons, East Pakistan: 10,000 tons (principally fresh fish to West Bengal, India) while the export of fertilizers and meal to Europe and Ceylon was 2,000 tons. A joint company with American and Pakistani capital have installed a freezer at Karachi and have till now sent some samples of frozen shrimps to the United States. Another Pakistani company has started a canning plant at Karachi. The Central Fisheries Department has been conducting fishing with *Ala*, a trawler received as part of the assets of the Government of Pakistan. Exploratory fishing, specially for shrimps is also being conducted from a 67-foot vessel acquired under the American aid programme. The work on fish harbour at Kara started under the guidance of an American H Engineer.

A preliminary report on the mechaniza fishing craft has been received from F.A.O. recommendations contained therein are being mented. On the recommendations of the experts who surveyed East Pakistan, a sche the 'collection of fish from Sunderbans area marketing' has been finalized. Two engi being provided for two carrier vessels ba Khulna. Two further carrier boats are reconditioned to carry fish to Chittagong Fishermen's Co-operative Society.

18. In *Thailand*, the number of 'pohs' traps, which are the principal coastal fishing chub-mackerel (*Rastrelliger* spp.) varies from year. There were 1,177 units in 1948, 1,16 in 1949, 1,047 units in 1950, 1,122 units i 1,254 units in 1952, and 1,334 units in 195 Chinese purse seine with mechanized craft carriers showed a remarkable increase sinc The numbers were 37 units in 1948, 52 units i 59 units in 1950, 71 units in 1951, 126 units i and 121 units in 1953.

The catch in 1953 was about the same as i as reflected by the fresh fish landing in B Wholesale Fish Market, but the price was low that in 1949. This was interpreted by t demand of the salted Rastrelliger in the Ind market. In 1954 the catch of Rastrellig estimated to be about 3 times of that in 19 the extremely low prices for salted Rast caused great hardship among fishermen. T expected to be a much smaller number of p Chinese purse seine fishing units in opera 1955.

In 1954, shrimp trawling was started at the of Chao Phya River. The result was encou One unit consists of a one to ten ton boat a to three trawls respectively. In 1955 it is e to have 200 trawling units. The catch per b about 50 kg. per day. The season lasted 4 m

19. The inshore fishing grounds of *Hon* are confined to waters up to 20 fathoms s the Colony; these waters are fished by purse gill netters, shrimp beam trawlers and small The deep sea fishing grounds are in waters f to 65 fathoms along the coast of Kwang province, China, extending from 111°30′ t East longitudes and between 20°15′ to North latitudes. These waters are fished by t and longliners.

In the following notes information is provi the 16 important species of food fish landed

by Hong Kong fishermen. On the whole the was a good one but attention is drawn to the catches of Red Sea Bream and Snapper, attri- to the increased activities of mechanised . Lower yields of Yellow Croaker and Herring are attributed to adverse climatic ons but there is no reasonable explanation for ll in catches of Anchovies. Of interest s the reduction in size of the average catch of Fish and the greatly increased yields of el Scad, Golden Sardine, Conger Pike, Fish and Silver Shrimp. There is no reason pose, despite the greatly increased number hanised craft working both inshore and in ea fishing grounds, that there has been any decl ne in fish populations.

) Golden Thread—*Synagris virgatus* (Houttuyn). Golden Thread are caught mainly by deep sea longliners along the coast of Kwang Tung where the depth ranges from 45-65 fathoms with muddy bottom. The fishing season lasts throughout the year but from February to April, owing to the spawning period, large quantities are usually caught as compared with the rest of the season. Landings of this species during the year were the highest since the war. It is said that the good catches were due to reduced shark activity in the fishing ground on the west coast of Kwang Tung. Catches were steady and there was little damage to gear from sharks. Fishermen changed their fishing waters frequently to avoid shark damage to gear.

Red Sea Bream—*Taius tumifrons* (Schlegel). Red Sea Bream is the main catch of deep sea trawlers and long liners. The fishing ground for this species coincides roughly with that of Golden Thread. The fishing season lasts throughout the year but fish are especially abundant in winter and spring. Catches for the year were considerably reduced in number and size as compared with previous seasons. Fishermen claim that this might have been a result of overfishing by mechanized trawlers.

Lizard Fish—*Saurida argyrophanes* (Rich). This species is a sea bottom fish and is caught mainly by deep sea trawlers on the fishing grounds from 50-65 fathoms deep with sandy and muddy bottom along the coast of Kwang Tung. The migration of Lizard Fish is from the west coast to the east coast of Kwang Tung during September to April. The fish spawn in the east coast from February to April and move away when the spawning season is over. Production during the year was high but catches consisted mainly of medium sized fish.

(4) Melon-seed—*Psenopsis anomala* (Schlegel). Melon-seed is a sea bottom fish and is caught by deep sea trawlers in the fishing grounds with muddy bottom on the west coast of Kwang Tung in 30-50 fathoms. Production was high in October and November, 1954. The fish spawn in March and April and move away after the spawning season.

(5) Yellow Croaker—*Pseudosciaena crocea* (Richardson). Yellow Croaker is a seasonal fish and is caught by gill netters. The migration of this species to the Pearl River estuary for the purpose of spawning begins from September and lasts until December. This species usually appears first in the area off Ladrone Island and then moves gradually to the shallow water near Hong Kong when the weather is warm and fine. The season was spoiled by the typhoon of November 1954 which drove the Yellow Croaker to the east coast of Kwang Tung near Swabue and Kit Shak.

(6) Mackerel Scad or Horse Mackerel—*Decapterus lajang* (Bleeker). This species is a seasonal fish and is caught by large purse seiners at a depth of from 20-30 fathoms on the south and southeast of Hong Kong near Ping Hoi and Lema Island. Fishing lasts from November to April but fish are most abundant when the weather is warm and fine. During the season Mackerel Scad appeared in large shoals in February and March on the west of Hong Kong near Ladrone Island and St. John Island. Production in the normal fishing ground on the southeast of Hong Kong was low. Many fishermen reported that they had seldom had such good catches of Mackerel Scad.

(7) Anchovies—*Stolephorus* spp. Anchovies are caught by small purse seiners in the inshore waters throughout the year. February, March, July and August are the best months for this species. Unfortunately, catches have been poor over the past two years. The reason for this is unknown.

(8) Carangids. Carangids are caught by small purse seiners in the inshore waters from

May to July but the fishing season during the year was extended to September. Production was good especially in June and July in the areas near Lintin and Lema Island after which the fish moved gradually eastward to the Nine Pin Island and Port Shelter.

(9) Golden Sardine—*Sardinella aurita* (Cuv. & Val.). Golden Sardine is the main catch of purse seiners. The fishing ground is confined to the inshore water near Lema Island. The fishing season starts from August and lasts to October but the season during the year under review began one month earlier and extended to November. Fish appeared in great abundance in Hong Kong waters near Po Toi, Lema Island and Mirs Bay.

(10) Conger Pike—*Muroenesox arabicus* (Bloch and Schneider) Conger Pike is the main catch of inshore long liners. The fishing ground is mainly confined to the inshore waters within a depth of 20 fathoms. Fishing continues throughout the year, but January-March is the period when the catch is usually higher than the rest of the year. The production of Conger Pike increased about 50% during the year. Some of this increase has followed mechanization of longliners which now operate in a good Conger Pike ground west of Ladrone Island.

(11) Hair Tail—*Trichiurns haumela* (Forskal). Hair Tail are caught by small longliners in the inshore waters throughout the year but are most abundant in March and April. The catch in February and March was low owing to the big shoals of cuttle fish in the fishing ground near Po Toi Island and Lema Island which took the baits from the longlines.

(12) White Herring—*Ilisha elongata* (Bennett). White Herring is a seasonal fish and comes to the Hong Kong water from April to June. The fishing season started late in 1954. White Herring appeared in the Tai O area in May and disappeared at the beginning of June. It is said that the Pearl River flood had reduced the water salinity in the normal fishing ground.

(13) Cuttlefish—*Sepia* spp. This is seasonal, usually migrating to the Hong Kong waters in the spring season. It is caught by hand liners and purse seiners. The Cuttlefish season started earlier this year. Large quantities appeared in the area near Po Toi Island in October, December, February and March when the was warm and fine and the sea w The total yield for the season is e at over 80,000 piculs. Fisher many years experience claimed t had seldom seen such large nu Cuttlefish.

(14) Snapper—*Pagrosomus major* (S This species migrates to the area on the eastern coast of Hon for spawning in winter. Large q always appear in Tolo Harbour and are caught by beach seines. tion during the year, however, w as only a small quantity appe Mirs Bay. Fishermen said t large number of mechanised trawlers operating along the co interfered with Snapper fishing.

(15) Shrimp—*Penaeopsis* spp. Catche shrimp in summer and autum abundant in the area from I Island to Lema Island where fishing ground was discover mechanized shrimp trawlers. T is situated outside the Pearl River

(16) Silver Shrimp—*Acetes* spp. This appears mostly in the shallow wa the Pearl River estuary where bottom is sandy and is caught fishermen in Tai O and Cheun with push nets and Chinese seine best fishing seasons are duri summer and winter. In Januar shoals of Silver Shrimp were dis in the deep water area near Lem and were fished successfully b seiners. The total catch was es at over 2,000 piculs. The catch net fishermen in the shallow wat was poor as the Silver Shrimps were by mechanized purse seiners bef could come close inshore.

20. In *Mayala*, the outstanding feature was the continuous bad weather which m affected total landings. The South-west m in the earlier part of the year and the No monsoon in the latter part were both excep severe, keeping craft in port, fishermen ash destroying fishing stakes, involving the indus only in loss of income but also of capital equ That the total drop in landings was only of th of 8.4% below the figure for 1953 is entir to the other significant feature, the develop mechanization. It can no longer be said t fishing industry in Malaya is extremely ba Mechanization started in about 1949 and

craft were built and engines installed creasing numbers. The total number of licensed during the year was 21,839 and of these 4,052 were powered boats. The change which has come about in the industry, in the past five years, can best be illustrated in tabular form.

ar	Landings (Tons)	Number of Fishermen	Number of Gear	Number of Powered Boats	Number of Non-powered Boats
1949	104,880	71,403	21,139	327	21,793
1954	109,934	49,532	18,654	4,052	17,787

le the change has been gradual, the com- n between the two end-years of the five-year shows most markedly the effect of mechaniza- bringing about a big reduction in the number ermen; a reduction in the amount of gear ed and a significant increase in the number of ed boats, although the total number of boats d is about the same.

retail price of fish in the higher grades re- l static on the average but the price of the lower dropped a little. Increasing quantities e available on the fresh fish market due to ftake for making dried fish falling, but the market recovered during the later part of the Ice was in adequate supply, although it ed that the manufacturers will take steps to e their production potential in the Southern f Trengganu, as two factors are expected to ce the demand for ice in the future. Firstly, w main road through Pahang, known as the Road, will be opened shortly which will put st Coast in close touch with Central Malaya condly the efforts of the Department to fy the production economy of the fishermen, they will not be as dependent as hitherto on lk supplies of lower grade fish, for their liveli-

le experimental trial loads of fish in insulated ium containers have been successfully placed markets of Central Pahang, the fish being sed for M $4 per picul and sold for M $35 per fter transportation in ice, it is clear that the rice would be depressed if greater and regular ties were available to the consumer, and the g price differential might well not be adequate e such distribution profitable. The higher are not in such prolific supply and are always and from the consumers of the higher income and it is felt that in supplying fresh fish to ew Villages and towns of Central Malaya, be possible to provide an economical pay-load ed high and low grade fish, so that the bulk of low grade fish may reach these potential markets at a low price.

Considerable success has already been achieved in the operation of *bubus* (portable traps) from an improved type of craft with a small inboard diesel engine. These traps, set in holes and depressions in the sea-bed, among rocks and coral, catch the higher grade perch and snappers. When the season for this form of fishing is over, the same craft are used in trolling for Spanish Mackerel which is always in good demand.

The general relationships of the Department with the Rural and Industrial Development Authority have been most satisfactory. In general terms it may be said that in any project or scheme the Department provides the technical knowledge for the Rural and Industrial Development Authority which functions as a financing corporation. Above all, the officers of the Department of Fisheries endeavour to see these schemes and projects in their proper context in the rural communities concerned and do not regard them as isolated entities.

The Fisheries Division of the Department of Commerce and Industry is administered by a Fisheries Officer with a staff of twenty-six Fisheries Inspectors. Local production is actively encouraged by the introduction of improved techniques, new methods and materials and the application of scientific research to fisheries. The Government is also actively engaged in raising the standard of living of the local fishermen and in assisting them to meet the changing conditions within the industry.

The South China Sea and the fringes of the Indian Ocean at the northern entrance to the Malacca Straits were surveyed by the departmental vessel, *M.V. Dunvegan* and commercial fishing vessels operating on Government subsidy against losses. Rich and extensive longline grounds for Red Snapper and China Sea Bream were found and units of the Singapore longline fishing fleet were diverted to these rich grounds.

The utilization of swamps for the cultivation of fish and prawns is encouraged. Experiments designed to increase the yield of these brackish water ponds were initiated by the establishment of a small experimental brackish water fisheries station in the Colony. The Regional Fisheries Research Station is now in the process of construction at Changi. It is envisaged that the research work of this station will contribute towards the fuller development of the fishing industries of the British territories of South-East Asia.

The Fisheries Loans Fund and the Fishing Materials Purchase Account were utilised to assist fishermen to purchase fishing gear and vessels to modernise the industry. The mobile fisheries unit continued its operations in instructing the fishermen on the maintenance and repair of their boat engines. Many fishermen are now able to maintain their engines in good condition, thus increasing their fishing time at sea.

In Table I are shown the revised figures for total marine fish landings for the past five years, with their values. It will be noticed that landings are not increasing. While there are many reasons which may be adduced to account for this, such as emergency operations including coastal curfews, bad weather and the change-over to mechanization bringing with it inevitable minor snags in the early stages, a nòte of warning must be sounded. The Malayan fishing industry has operated for many decades in a narrow coastal sea-belt and with the increased demand for fish, intensity of operation has increased. While it is not possible to assert dogmatically that overfishing is occurring, there is a probability that the reduced fishing during World War II caused a resurgence of fish stocks, which enabled the industry to rehabilitate rapidly. This feature which is now coming to light indicates a real need for the refinement of statistical procedure which is in hand. It is an indication that fish must be sought further afield than at present and that provision must be made to ensure that an offshore fleet is trained and developed.

The exploratory work of the Headquarters vessel, *M.F.V. Dunvegan* which was commenced in 1953, was continued until September 1954. Her operations were extensive but nowhere were grounds found which justified more intensive operations. On the occasions when indications of good quality fish in any quantity occurred, the nature of the sea-bed and the restricted area which contained the fish precluded the possibility of development of that particular area.

From 1928 to 1931 the Government engaged the coal burning Castle-type Grimsby trawler, *S.T. Tongkol.* Nowhere, either on extensive or intensive operations, could this vessel economically exploitable trawling grounds for tion with an otter or Vigneron-Dahl trav 1953-54 a small modern economical trawler, could be operated more easily, had similarl appointing results. It may now therefore be gorically stated that within reasonable ste distance of Malaya, there are no bottom gr capable of economical exploitation by the otte or its modification, the Vigneron-Dahl traw

It is also improbable that the paired bul or pareja trawl would pay. Four units o gear came to Singapore from Hong Kong in by the end of 1954, with the fall in prices due cessation of the rubber boom, they all had ceased to operate or left Singapore.

There are restricted areas in which be living fish do occur and the latter part of the work of the *Dunvegan* was to plot these off the Trengganu coast, by means of the sounder. When such an area had been disc from the trace on the echo-sounder, it was fo up by handlining or by setting portable traps in Malaya as *bubus.*

It soon became apparent that the accurate mination of these areas, which are the natural l for certain types of sea perch, snapper and gr will be most profitable for the fishermen and t using small motor boats to carry themselve their fishing gear to these areas, a profitable to the fishermen and valuable food to the com may be assured.

The present work of the *Dunvegan* is the for two types of Tuna off the North-west c Malaya, to establish the limits of their distrib the best time for fishing for them and the economical way of catching them.

General improvement in emergency cond has brought about increased interest in fish c throughout the Federation and this is partic emphasised in Chinese New Villages. A Malays interest has developed in Kedah, Per Pahang, while the well established interest in Sembilan and Johore has continued.

A number of enquiries have been received estates and mines on the possibility of fish c as an additional source of protein food for the force. Where water supply and terrain are su there is no reason why schemes of this nature s not go forward, especially with *Tilapia mossa*

21. In so far as the Island Colony of *Sin* is concerned, the fishing grounds exploited by fishermen extend from the inshore areas Singapore to the offshore areas in the South

ıd the Indian Ocean. The main inshore methods are fixed traps, lines, beach seines, ets and drift nets. In the offshore areas pair longlines, troll lines and drift nets are used. lition, many fishermen are engaged in the g of prawns and estuarine fish from swamps have been converted into brackish-water Others are engaged in the culture of carp ıer fish in fresh-water ponds.

number of licensed fishermen employed in lustry dropped from 6.672 in 1953 to 6,023 4 of whom about 70 per cent were Chinese per cent Malays and others. The number of gears licensed was 2,139 and the number of boats was 3,231. Of the latter 21 per cent were powered vessels representing an aggregate of 2,722 tons whilst the remaining 79 per cent were non-powered. The mechanization of the industry is growing apace. Capital for this industry is provided either by the producer himself or through wholesale agents and dealers.

Fresh fish is landed at various points on the Island and auctioned at the two City Council Wholesale Markets or the three privately owned wholesale markets. Auctions are conducted by wholesale agents who receive a commission from the fisherman and pay a fee to the market owner.

AUCTION MARKET HANDLINGS OF FISH
(tons)

	1952	1953	1954
roduction	4,271.9	4,537.4	4,260.3
from Indonesia..	2,031.4	1,935.9	1,741.0
from Burma, Borneo, Thailand, Hong Kong and India ..	107.8	191.1	134.0
from the Federation of Malaya	3,242.4	3,379.9	3,907.7
	9,653.5	10,044.3	10,043.0

ill be observed that local production has now l a peak and is not expected to increase further e of the shortage of nearby fishing grounds. s from the Federation of Malaya are increasing me.

estimated that about 86 per cent of the fish led in the city area and the remaining about cent in the rural area. The fish is sold fresh le use is made of cold storage facilities. Small amounts of certain types are boiled and sold during seasons of glut.

Singapore serves as the entrepot for salt fish as well as other marine produce. Imports of salt fish come mainly from Thailand, Cambodia, and Riouw. The dried fish are sorted, redried and then repacked in Singapore for despatch mainly to Indonesia. The large entrepot trade in salt fish is declining rapidly on account of the restrictive measures of certain importing countries.

IMPORTS AND EXPORTS OF SALT DRIED FISH

	1952		1953		1954	
	Tons	Value	Tons	Value	Tons	Value
		S $		S $		S $
..	49,566	34,325,384	30,441	19,669,755	12,163	11,718,440
..	46,148	44,994,151	28,690	25,523,289	11,390	10,455,947

trade in other marine products such as beche-, blachan, seaweed, fish maws, shark fins, snail and trochus shell and canned fish, in- canned salmon and canned sardine, ed to 5,680 tons valued at S $10,118,278 in and 3,303 tons valued at S $6,187,127 in during the year.

No reports have been received on the status of the fisheries industries in Cambodia, the Australian territories of Papua and New Guinea, French territory of New Caledonia, Indonesia, Korea, the Philippines, Portuguese Goa, Macau and Timor, Viet Nam or China.

LIST OF DELEGATES AND OBSERVERS

Member Government	*Name*	*Designation*	*Address*
Australia	Mr. D. J. Rochfod (Delegate)	Principal Research Officer	Division of Fisheries, (Marine Biological L tory, Cronulla, N Australia.
	Mr. H. Dunn (Adviser)	3rd Secretary	Australian Embassy, Japan.
Burma	U Ba Kyaw (Delegate)	Executive Officer	Division of Fisheries, A tural & Rural Develo Corporation, Rangoon Road, Kamayut, Burma
Cambodia	Mons. Chuop-Hell (Delegate)	Directeur	Service des Eaux, Cha Peches a Phnom Penh bodia.
	Mons. Dom-Saveun (Alternate)	Chef	Cantonnement des Pech Phnom Penh, Phnom Cambodia.
Ceylon	Mr. E. R. A. de Zylva (Delegate)	Deputy Director of Fisheries	Fisheries Research Statio Box 531, Colombo, C
France	Mons. J. Lemasson (Delegate)	Conservateur des Eaux et Forets	Ministere de la France c Mer, 27 rue Oudinot 7e, France.
France	Mons. R. Serene (Alternate)	Conseiller	Institut Oceanographiqu Nha Trang, Station M de Cauda, Nha Tran Nam.
India	Dr. N. K. Panikkar (Delegate)	Chief Research Officer	Central Marine Fisheri search Station, Mar Camp, P.O. S.Rly, S.
Indonesia	Mr. G. M. C. Kasuma (Delegate)	Chief	General Division, Sea Fi Dept., (Pusat Djawata kanan Laut), Djalan 12, Djakarta, Indones
	Mr. H. Saanin (Alternate)	Chief	Laboratory for Inland ries, (Laboratorium Pe Darat), Tjikeumeuh Bogor, Indonesia.
	Mr. M. Ahjar (Adviser)	Chief	Inland Fisheries Service, Java Province, (Dj Perikanan Darat, P Djawa Barat Djalan Kentjana 17, Bandung Indonesia.
	Mr. R. A. Kartono (Adviser)	Chief	Research Division, Sea ries Dept., (Bagian dikan Pusat Djawata kanan Laut), Djalan 12, Djakarta, Indones

Government	Name	Designation	Address
sia (Contd.)	Mr. Eddiwan (Adviser)	Chairman	Federation of Indonesian Fishermen Co-operative Societies, (Gabungan Kooperasi Perikanan Indonesia) Djalan Kerapu 14, Djakarta, Indonesia.
	Mr. S. Maetani (Delegate)	Director	Fisheries Agency, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
	Dr. K. Kuronuma (Alternate)	Chief	Fresh Water Fisheries, Research Laboratory, Hinomachi, Tokyo, Japan.
	Mr. S. Okamoto (Adviser)	Chief	Fisheries Administration Division, Fisheries Agency, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
	Dr. M. Fujinaga (Adviser)	Chief	Research Division, Fisheries Agency, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
	Mr. T. Nakai (Adviser)	Chief	Resources Division, Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.
	Dr. I. Kubo (Adviser)	Professor	Tokyo Fisheries University, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.
	Dr. M. Uda (Adviser)	Professor	Tokyo Fisheries University, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.
	Mr. S. Takayama (Adviser)	Chief	Fishing Gear and Method Division, Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.
	Dr. S. Watari (Adviser)	Chief	Biological Research Section, Fisheries Agency, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
	Mr. T. Sone (Adviser)	Chief	Technological Research Section, Fisheries Agency, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
	Mr. N. Oka (Adviser)	Chief	Data and Statistics Section, Fisheries Agency, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
	Mr. K. Kawakami (Adviser)	Secretary	1st Section, Treaties Bureau, Ministry of Foreign Affairs, Tokyo, Japan.
	Mr. Choi Kyu Hah (Delegate)	Consul General	Korean Mission, No. 1-5 Takeyacho, Azabu, Minato-ku, Tokyo, Japan.

Member Government	*Name*	*Designation*	*Address*
Korea (*Contd.*)	Mr. Chee Choul Keun (Alternate)	Director	Fisheries Bureau, Off Marine Affairs, Seou public of Korea.
Netherlands	Mr. G. Elshove (Delegate)	Commercial Secretary	Netherlands Embassy, Japan.
Pakistan	Dr. M. R. Qureshi (Delegate)	Director of Fisheries	Central Fisheries Dep Nusserwanjee Bldg., I Street, Karachi 3, Pakis
Philippines	Mr. C. Martin (Delegate)	Chief	Division of Fisheries logy, Bureau of Fi M. H. del Pilar Street, Philippines.
Thailand	Mr. Boon Indrambarya (Delegate)	Director-General	Department of Fisheries, kok, Thailand.
	Mr. Prida Karnasut (Alternate)	Chief	Division of Aquiculture, ment of Fisheries, B Thailand.
United Kingdom	Dr. F. D. Ommanney (Delegate)	Director	Singapore Regional Fishe search Station, P.O. B Singapore.
	Prof. D. Barker (Alternate)	Acting Director	Fisheries Research Unit, sity of Hong Kong, Hon
	Dr. Tham Ah Kow (Adviser)	Chief Fisheries Officer	Fisheries Division, Depart Commerce and Industr Box 749, Singapore.
	Mr. W. D. Orchard (Adviser)	Fisheries Officer	Department of Agricultur eries and Forestry, Kor Street, Laichikok, Hong
	Mr. I. Petersen (Adviser)	Marketing Officer	Co-operative and Ma Department, Tung Kun Yaumati, Kowloon, Hong
	Mr. E. F. Szczepanik (Adviser)	Lecturer	Department of Economics, sity of Hong Kong, Hong
	Mr. J. D. Bromhall (Adviser)	Chief Scientific Officer	Fisheries Research Unit, sity of Hong Kong, Hong
United States of America	Dr. L. A. Walford (Delegate)	Chief	Branch of Fishery Biology Fish & Wildlife Service, ington, 25, D.C., U.S.A.
	Dr. A. L. Tester (Alternate)	Director	Pacific Oceanic Fishery gations, P.O. Box 3830, lulu, Hawaii.
	Mr. G. M. Taggart (Adviser)	Chief	Fisheries Division, USA Administration of the I Islands, Naha, Okinawa. 331, San Francisco, Cal
Viet Nam	Dr. Ngo Ba Thanh (Delegate)	Chef	Service National des Peche times, Ministere de T Publics, Saigon, Viet Na
	Mons. Cao Thien Buu (Alternate)	Chef	Service National des Peche tinentales, Direction de et Forets, Saigon, Viet I

ber Governments and Organizations	*Name*	*Designation*	*Address*
	Mr. A. S. Matias (Observer)	Charge d'Affaires	Portuguese Legation, Tokyo, Japan
nd	Mr. C. A. H. Paul (Observer)	Commercial Attache	New Zealand Legation, Tokyo, Japan.
	Mr. A. Namdar (Observer)	Commercial Attache	Iranian Embassy, Tokyo, Japan.
	Mr. E. A. Dandilly (Observer)	Cultural Attache	French Embassy, Tokyo, Japan.
	Dr. A. L. Tester (Observer)	Director	Pacific Oceanic Fishery Investigations, P.O. Box 3830, Honolulu, Hawaii.
	Mr. H. van Pel (Observer)	Fisheries Officer	South Pacific Commission, Pentagone, Noumea, New Caledonia.
	Mr. J. Smid (Observer)	Scientific Officer	UNESCO Science Co-operation Office for South East Asia, Djalan Diponegoro 76, Djakarta, Indonesia.
	Mr. Y. Fuji (Observer)	Chief	Oceanographical Section, Central Meteorological Observatory, Otemachi, Chiyoda-ku, Tokyo, Japan.
	Mr. J. S. Yonamine	Fisheries Aide	Fisheries Division, USA Civil Administration of the Ryukyu Islands, Naha, Okinawa. (APO 331, San Francisco, California).
	Mr. S. Mekaru	Chief	Fisheries Bureau, Government of the Ryukyu Islands, Naha, Okinawa.
	Mr. W. C. Neville	Representative	Columbia River Packers Association, Inc., Room 438 Hotel Tokyo, Chiyoda-ku, Tokyo, Japan.
	Mr. R. H. Fiedler	Chief Technical Assistance Officer	Fisheries Division, FAO, Viale delle Terme di Caracalla, Rome, Italy.
retariat	Dr. Cecil Miles	Executive Secretary	Regional Fisheries Officer, Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand.
	Dr. T. J. Job	Technical Secretary	Assistant Regional Fisheries Officer, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand.

Non-Member Governments and Observer Organizations	*Name*	*Designation*	*Address*
IPFC Secretariat —(cont.)	Mr. Jan-Olof Traung	Technical Secretary	Chief, Fishing Boat Sectio nology Branch, Fisheri sion, FAO, Viale delle di Caracalla, Rome, I
	Mr. S. J. Holt	Technical Secretary	Biologist, Biology Branch eries Division, FAO, Vi Terme di Caracalla, Italy.
	Mr. C. Coltman	Information Officer	Regional Information C FAO Regional Office f and the Far East, Mansion, Phra Atit Roa kok, Thailand.
	Miss Agnes Jiannee	Conference Officer	Technical Assistant, FAO al Office for Asia and East, Maliwan Mansio Atit Road, Bangkok, T

Mrs. K. Kimura	Interpreter	(English-French)
Mrs. M. Mishima	,,	,,
Mr. S. Oishi	,,	(English-Japanese)
Mr. F. Aoki	,,	,,
Mr. T. Matsuo	,,	,,
Mr. Eichi Maruyama	Liaison Officer	
Mr. Nobutatsu Yokoyama	,,	
Mr. George Kataoka	,,	
Mr. Norio Fujinami	,,	
Mr. M. Furono	Transport Officer	
Miss M. Uwano	General Information Officer	
Mr. T. Homma	Travel Officer	

COUNCIL CORRESPONDENTS 1955-57

ber Government	*Administrative Correspondent*	*Bibliographic Correspondent*
A	The Secretary, Australian National FAO Committee, c/o Department of External Affairs, Canberra, Australia	Mrs. L. M. Willings, Fisheries Division, CSIRO Marine Biological Laboratory, Cronulla, N.S.W., Australia
	Secretary, Ministry of Agriculture & Forests, Union of Burma, Rangoon, Burma	U Ba Kyaw, Executive Officer, Division of Fisheries, Agriculture & Rural Development Corporation, Rangoon-Insein Road, Kamayut, Burma
A	Monsieur Sao-Leang, Chef de Division des Peches de Kandal, Direction des Eaux et Forets, Phnom Penh, Cambodia	Monsieur R. Lafont, Charge, l'Institut de Recherches Piscicoles, Phnom Penh, Cambodia
	Mr. E. R. A. de Zylva, Deputy Director of Fisheries, Fisheries Research Station, P.O. Box 531, Colombo, Ceylon	Mr. Y. Yogasunderam, Asst. Socio-economics Officer, Department of Fisheries, P.O. Box 531, Colombo, Ceylon
	Monsieur R. Serene, Conseiller de l'Institut Oceanographique de Nha Trang, Nha Trang, Viet Nam	Monsieur R. Serene, Conseiller de l'Institut Oceanographique de Nha Trang, Nha Trang, Viet Nam
	Dr. B. N. Chopra, Fisheries Development Adviser, Ministry of Food & Agriculture, New Delhi, India	Dr. D. V. Bal, Professor of Zoology, Institute of Science, Mahatma Gandhi Road, Bombay, India
A	Mr. G. M. C. Kasuma, Head, General Division, Sea Fisheries Department, Djalan Kerapu 12, Djakarta, Indonesia	Mr. H. Saanin, Head, Laboratory for Inland Fisheries, Tjikeumeuh 99, Bogor, Indonesia
	Mr. H. Hitomi, Chief of the Second Section, International Co-operation Bureau, Ministry of Foreign Affairs, Chiyoda-ku, Tokyo, Japan	Dr. N. Sasaki, Data and Statistics Section Fisheries Agency, No. 2-2, Kasumigaseki, Chiyoda-ku, Tokyo, Japan
	Mr. Chee Choul Keun, Director, Fisheries Bureau, Office of Marine Affairs, Seoul, Republic of Korea	Mr. Nam Sang Kyu, Chief, Fishing Section, Central Fisheries Research Station, Pusan, Republic of Korea
ANDS	Mr. D. C. Zwollo, Fisheries Division, Dept. of Agriculture and Fisheries, Hollandia, Netherlands New Guinea	Mr. D. C. Zwollo, Fisheries Division, Dept. of Agriculture and Fisheries, Hollandia, Netherlands New Guinea
	Dr. M. R. Qureshi, Director, Central Fisheries Department, Dundas Street, Karachi-3, Pakistan	Dr. A. H. Quadri, Department of Zoology, University of Karachi, Karachi, Pakistan
NES	Mr. C. Martin, Chief, Division of Fisheries Technology, Bureau of Fisheries, Manila, Philippines	Mr. I. A. Ronquillo, Fishery Biologist, Bureau of Fisheries, Manila, Philippines
)	Mr. Boon Indrambarya, Director-General, Department of Fisheries, Bangkok, Thailand	Mr. J. Thiemmedh, Department of Fisheries, Bangkok, Thailand
r Federation of , Singapore, , and Sarawak)	Mr. A. F. Maddocks, U.K. Liaison Officer with U.N. Organizations, British Embassy, Bangkok, Thailand	Mr. D. W. Le Mare, Director of Fisheries for Federation of Malaya & Singapore, H.Q. Fisheries Department, P.O. Box 459, Penang, Malaya
r Hong Kong)	Director, Department of Agriculture, Fisheries & Forestry, Hong Kong	Director, Department of Agriculture, Fisheries & Forestry, Hong Kong
	Dr. A. L. Tester, Director, Pacific Oceanic Fishery Investigations, P.O. Box 3830, Honolulu, Hawaii	Mr. J. E. King, Fishery Research Biologist, POFI, Box 3830, Honolulu, Hawaii
I	Monsieur Tran Van Tri, Inspecteur des Peches, Direction de la Navigation, Ministere de Travaux Publics, Saigon, Viet Nam	Monsieur Cao Thien Buu, Chef, Service National des Peches Continentales, Direction des Eaux et Forets, Saigon, Viet Nam

TECHNICAL COMMITTEE I AND PANELS

Member Government	*Technical Committee I*	*Panel A (Inland Fisheries)*	*Panel B (Sea Fisheries)*
AUSTRALIA	Dr. M. B. Blackburn, Acting Chief, Fisheries Division, CSIRO Marine Biological Laboratory, Cronulla, N.S.W., Australia	Dr. A. G. Nicholls' Fisheries Division, CSIRO Marine Biological Laboratory, Cronulla, N.S.W., Australia	Mr. J. M. Thomson, Fisheries Division, CSIRO Marine Biological Laboratory, Cronulla, N.S.W., Australia
BURMA	U. Ba Kyaw, Executive Officer, Division of Fisheries, Agricultural & Rural Development Corporation, Rangoon-Insein Road, Kamayut, Burma	U Kyaw Nyi, Division of Fisheries, Agricultural & Rural Development Corporation, Rangoon-Insein Road, Kamayut, Burma	U Tint Hlaing, Division of Fisheries, Agricultural & Rural Development Corporation, Rangoon-Insein Road, Kamayut, Burma
CAMBODIA	Mr. Dom-Saveun, Chef, Service des Eaux, Chasse et Peches a Phnom Penh, Cambodia	Mr. Dom-Saveun, Chef, Service des Eaux, Chasse et Peches a Phnom Penh, Cambodia	(No nomination)
CEYLON	Mr. E. R. A. de Zylva, Deputy Director of Fisheries, Fisheries Research Station, P.O. Box 531, Colombo, Ceylon	Mr. A. Indrasena, Superintendent, Freshwater Fisheries, Fisheries Research Station, P.O. Box 531, Colombo, Ceylon	Mr. S. Sivalingam, Research Officer, Fisheries Research Station, P.O. Box 531, Colombo, Ceylon
FRANCE	Monsieur J. Lemasson, Conservateur des Eaux et Forets, Ministere de la France d'Outre Mer, 27 rue Oudinot, Paris 7e, France	Monsieur J. Lemasson, Conservateur des Eaux et Forets, Ministere de la France d'Outre Mer, 27 rue Oudinot, Paris 7e, France	Mons. M. Y. Legand, Chef, Laboratoire d'Oceanographie de l'Institut Francais d'Oceanie (l'Office Francais de la Recherche Scientifiique d'Outre Mer), Noumea, New Caledonia
INDIA	Dr. B. S. Bhimachar, Chief Research Officer, Central Inland Fisheries Research Station, 471-1, Strand Road, Calcutta-7, India	Mr. K. H. Alikunhi, Central Inland Fisheries Sub-Station, Cuttack, (Orissa), India	Dr. S. Jones, Central Marine Fisheries Sub-Station, West Hill, Malabar, South India
INDONESIA	Mr. H. Saanin, Chief, Laboratory for Inland Fisheries, (Laboratorium Perikanan Darat), Tjikeumeuh 99, Bogor, Indonesia	*Mr. H. Saanin, Chief, Laboratory for Inland Fisheries, (Laboratorium Perikanan Darat), Tjikeumeuh 99, Bogor, Indonesia	Mr. R. S. Natadisastra, Inspector, Sea Fisheries, Tandjung Pinang, Riouw, Indonesia
JAPAN	*Dr. K. Kuronuma, Chief, Fresh Water Fisheries, Research Laboratory, Hinomachi, Tokyo, Japan	Dr. K. Kuronuma, Chief, Fresh Water Fisheries, Research Laboratory, Hinomachi, Tokyo, Japan	Mr. T. Nakai, Chief, Resources Division, Tokai Regional Fisheries Research Laboratory, Tsukishima, Chou-ku, Tokyo, Japan
KOREA	Mr. Chee Choul Keun, Director, Fisheries Bureau, Office of Marine	Mr. Whang Ho Chung Chief, Chin Hae Branch, Central Fisheries Re-	Mr. Chee Choul Keun, Director, Fisheries Bureau, Office of Marine

	Bureau of Fisheries, M.H. del Pilar Street, Manila, Philippines	Street, Manila, Philippines	Bureau of Fisheries, M.H. del Pilar Street, Manila, Philippines
THAILAND	Mr. P. Karnasut, Chief, Division of Agriculture, Department of Fisheries, Bangkok, Thailand	Mr. J. Thiemmedh, Department of Fisheries, Bangkok, Thailand	Mr. S. Charernphol, Department of Fisheries, Bangkok, Thailand
U.K.	Dr. F. D. Ommanney, Director, Singapore Regional Fisheries Research Station, P.O. Box 749, Singapore	Mr. J. D. Bromhall, Chief, Scientific Officer, Fisheries Research Unit, University of Hong Kong, Hong Kong	*Dr. F. D. Ommanney, Director, Singapore Regional Fisheries Research Station, P.O. Box 749, Singapore
U.S.A.	Dr. L. A. Walford, Chief, Branch of Fishery Biology, U.S. Fish & Wildlife Service, Washington, 25, D.C., U.S.A.	Dr. L. A. Walford, Chief, Branch of Fishery Biology, U.S. Fish & Wildlife Service, Washington, 25, D.C., U.S.A.	Dr. A. L. Tester, Director, Pacific Oceanic Fishery Investigations, P.O. Box 3830, Honolulu, Hawaii
VIET NAM	Mons. Cao Thien Buu, Chef, Service National des Peches Continentales, Direction des Eaux et Forets, Saigon, Viet Nam	Mons. Cao Thien Buu, Chef, Service National des Peches Continentales, Direction des Eaux et Forets, Saigon, Viet Nam	Dr. Ngo Ba Thanh, Chef, Service National des Peches Maritimes, Ministere de Travaux Publics, Saigon, Viet Nam

* Indicates Chairman of Committee or Panel.

Member Government	*Technical Committee II*	*Panel A* (Craft and Gear)	*Panel B* (Food Technology)	*Panel C* (Socio-economics and Statistics)
AUSTRALIA	Mr. F. F. Anderson, Director, Commonwealth Fisheries Office, Dept. of Com. & Agri., Kembla Bldg., 58 Margaret St., Sydney, N.S.W., Australia	Mr. F. F. Anderson, Director, Commonwealth Fisheries Office, Dept. of Com. & Agric., Kembla Bldg., 58 Margaret St., Sydney, N.S.W., Australia	Dr. J. Vickery, Chief, Div. of Food Preservation & Transport, CSIRO, Homebush, N.S.W., Australia	Mr. F. J. Kearns, Commonwealth Fisheries Office, Kembla Bldg., 58 Margaret St., Sydney, N.S.W., Australia
BURMA	U Ba Kyaw, Executive Officer, Division of Fisheries, Agricultural & Rural Development Corp., Rangoon-Insein Rd., Kamayut, Burma	U Ba Kyaw, Executive Officer, Division of Fisheries, Agricultural & Rural Development Corp., Rangoon-Insein Rd., Kamayut, Burma	(No nomination)	U E Than, Fish Marketing Co-operative Society, Rangoon, Burma
CAMBODIA	Mons. R. Lafont, Charge, l'Institut de Recherches Piscicoles, Phnom Penh, Cambodia Alternate: Mons. Sao Leang, Chief de Division des Peches de Kandal, Direction des Eaux et Forets, Phnom Penh, Cambodia	(No nomination)	Mons. R. Lafont, Charge, l'Institut de Recherches Piscicoles, Phnom Penh, Cambodia	Mons. Sao Leang, Chef de Division des Peches de Kandal, Direction des Eaux et Forets, Phnom Penh, Cambodia
CEYLON	Mr. L. F. Tisseverasinghe, Asst. Director of Fisheries, Fisheries Dept., P.O. Box 531, Colombo, Ceylon	Mr. L. F. Tisseverasinghe, Asst. Director of Fisheries, Fisheries Dept., P.O. Box 531, Colombo, Ceylon	Mr. E. St. C. Gunasekera, Research Chemist, Department of Fisheries, P.O. Box 531, Colombo, Ceylon	Mr. Y. Yogasunderam, Assistant Socio-economics Officer, Dept. of Fisheries, P.O. Box 531, Colombo, Ceylon
FRANCE	Mons. R. Serene, Conseiller, Institut Oceanographique de Nha Trang, Station Maritime de Cauda, Nha Trang, Viet Nam	(No nomination)	(No nomination)	(No nomination)
INDIA	Dr. D. Bhatia, Deputy Fisheries Development Adviser, Ministry of Food & Agriculture, New Delhi, India	Dr. C. V. Kulkarni, Director of Fisheries, Taraporewala Aquarium, Bombay, India	Dr. K. C. Saha, Director of Fisheries for West Bengal, 50-A Theatre Rd., Calcutta, India	Mr. G. N. Mitra, Director of Industries, Cuttack, Orissa, India
INDONESIA	Mr. G. M. C. Kasuma, Chief, General Division, Sea Fisheries Dept., (Pusat	Mr. R. A. Kartono, Chief, Research Division, Sea Fisheries Dept., (Bagian	Mr. J. R. Pattinasarany, Chief, Division of Commerce and Technology	Mr. Eddiwan, Chairman, Federation of Indonesian Fishermen Co-operative

		Tokyo, Japan	migaseki, Chiyoda-ku, Tokyo, Japan	migaseki, Chiyoda-ku, Tokyo, Japan
KOREA	Mr. Nam Sang Kyu, Chief, Fishing Section, Central Fisheries Research Station, Pusan, Republic of Korea	Mr. Nam Sang Kyu, Chief, Fishing Section, Central Fisheries Research Station, Pusan, Republic of Korea	Mr. Rhee Bong Nae, Chief, Processing Section, Central Fisheries Research Station, Pusan, Republic of Korea	Mr. Rhee Bong Nae, Chief, Processing Section, Central Fisheries Research Station, Pusan, Republic of Korea
NETHERLANDS	(No nomination)	(No nomination)	(No nomination)	(No nomination)
PAKISTAN	*Dr. M. R. Qureshi, Director of Fisheries, Central Fisheries Department, Dundas Street, Karachi-3, Pakistan	Dr. M. R. Qureshi, Director of Fisheries, Central Fisheries Department, Dundas Street, Karachi-3, Pakistan	Dr. M. R. Khan, Central Fisheries Department Dundas Street, Karachi-3, Pakistan	Mr. S. A. Jaleel, Central Fisheries Department, Dundas Street, Karachi-3, Pakistan
PHILIPPINES	Mr. C. Martin, Chief, Division of Fisheries Technology, Bureau of Fisheries, M.H. del Pilar Street, Manila, Philippines	Mr. S. B. Rasalan, Fishery Technologist (Projects Leader), Bureau of Fisheries, M.H. del Pilar Street, Manila, Philippines	Mr. J. I. Sulit, Chemist, Division of Fisheries Technology, Bureau of Fisheries, M.H. del Pilar St., Manila, Philippines	Mr. J. R. Montilla, Chief, Division of Commercial Fisheries Technology, Bureau of Fisheries, M.H. del Pilar Street, Manila Philippines
THAILAND	Mr. T. Bumradarinpai, Department of Fisheries, Bangkok, Thailand	Mr. S. Ruomruk, Department of Fisheries, Bangkok, Thailand	Mr. K. Suriyong, Department of Fisheries, Bangkok, Thailand	Mr. P. Thavaranusorn, Department of Fisheries, Bangkok, Thailand
U.K.	Dr. Tham Ah Kow, Chief Fisheries Officer, Fisheries Division, Department of Commerce and Industry, P.O. Box 749, Singapore	Fisheries Officer, Department of Agriculture, Fisheries and Forestry, Kom Tsun Street, Laichikok, Hong Kong	Marketing Officer, Co-operative and Marketing Department, Tung Kun Street, Yaumati, Kowloon, Hong Kong	Marketing Officer, Co-operative and Marketing Department, Tung Kun Street, Yaumati, Kowloon, Hong Kong
U.S.A.	Mr. G. M. Taggart, Chief, Fisheries Division, USA Civil Administration of the Ryukyu Islands, Naha, Okinawa. (APO 331, San Francisco, California)	Mr. G. M. Taggart, Chief, Fisheries Division, USA Civil Administration of the Ryukyu Islands, Naha, Okinawa. (APO 331, San Francisco, California)	Dr. M. E. Stansby, Fish & Wildlife Service, 2725 Mont lake Boulevard, Seattle 2, Washington, U.S.A.	Mr. L. S. Christey, Fisheries Adviser, I.C.A., c/o American Embassy, Karachi, Pakistan
VIET NAM	Dr. Ngo Ba Thanh, Chef, Service National Des Peches Maritimes, Ministere de Travaux Publics, Saigon, Viet Nam	Mons. Tran Van Tri, Inspecteur des Peches, Direction de la Navigation, Ministere de Travaux Publics, Saigon Viet Nam	Dr. Ngo Ba Thanh, Chef, Service National Des Peches Maritimes, Ministere de Travaux Publics, Saigon, Viet Nam	Mons. Nguyen Van Tich, Chef, Bureau Social Economique Service des Peches Maritimes, Ministere des Travaux Publics, Saigon, Viet Nam

* Indicates Chairman of Committee or Panel

LIST OF DOCUMENTS

6th SESSION

WORKING PAPERS

IPFC/C55/WKP	1	Agenda for 6th Council Session, Tokyo, Sept. 30–Oct. 14, 1955 (English and French
	2	Report of the Executive Committee to the 6th Session.
	2A	Review of the Council's Work.
	3	Proposal for amendment to Council's Agreement (English and French).
	4	Proposed amendments to the Rules of Procedure. (English and French).
	5	Notes on Parliamentary Procedure.
	5 (Draft 2)	Revised Proposal for Resolution regarding Parliamentary Authority.
	6	Proposal by Technical Committee I for an ' Indo-Pacific Fisheries Year '.
	7	Fish Culture in Rice Fields (English and French).
	8	Floating Weed Menace in Thailand.
	9	Proposed Rastrelliger Sub-Committee Meeting.
	10	The large mouth Black Bass, *Huro salmoides* (Lacepede) in the Philippines.
	11	Activities of the General Fisheries Council for the Mediterranean (June, 1955).
	12	Report of the Indo-Pacific Fisheries Council to the Conference of FAO for 1954-55.
	13	Accessions to the Library.
	14	Indian Committee on Standardization of names of Fishes and Fishery Subjects—Fre Fishes.
	15	Further notes on the functions of Technical Committees.
	16	Interim Report on the First FAO Fish Marketing Training Centre, Hong Kong, Ju August 21, 1954.
	17	Report to Sixth Session on the Status of the Fishing Industry.
	18	Report to IPFC from the Inter-Committee Working Group on Fisheries Development
	19	Report of Technical Committee I to the Sixth Session.
	19 (Add. 1)	Addendum to the Report of Technical Committee I to the Sixth Session.
	20	Soil Composition in Relation to Productivity of Fish Ponds.
	21	Control of Weeds in Fish Ponds.
	22	Amendment to the Council's Agreement.
	23	Report of Technical Committee II to the Sixth Session.
	23 (Add. 1)	Addendum to the Report of Technical Committee II to the Sixth Session.
	24	Review of FAO Technical Assistance in Fishery Development.
	25	A Review of Current Knowledge of *Rastrelliger* by J. D. F. Hardenberg.
	26	Communication from the Director, Fisheries Division, FAO.

5/WKP	27	Secretary's Report on Credentials.
	28	Report of the Editor General of Handbooks.
	29	Hilsa Report.
	30	Resume of Desiderata for Technical Contributions.
	31	International Technical Conference on the Conservation of the Living Resources of the Sea.
	32	Council Nominations, 1955-1956.
	32 (Rev. 1)	Ditto (page 11).
	33	Report of the Prawn Symposium.

SIUM PAPERS

5/SYM	1	The Prawn Fisheries of Ceylon, by E. R. A. de Zylva.
	2	Prawn Fisheries of India, by N. K. Panikkar, & M. K. Menon.
	3	Penaeid Prawn Fisheries of Australia with Special Reference to New South Wales, by A. A. Racek.
	4	Shrimp Fisheries of Pakistan, by M. R. Qureshi.
	5	Rate of Growth of the 'Sugpo' (Jumbo Tiger Shrimp), *Penaseus monodon* Fabricius with Notes on its Culture in Brackish-water Ponds, by M. N. Delmondo & H. R. Rabanal.
	6	Preliminary Studies on the Biology of the Palaemonid Prawn, *Leander styliferus* Milne-Edwards, by M. M. Kunju.
	7	Shrimp Exploration and Gear Research in the Gulf of Mexico, by H. R. Billis, Jr.
	8	Prawn Fisheries of the Philippines, by J. S. Domantay.
	9	Some Aspects of Preservation of Prawns in Madras, by R. Venkataraman, S. T. Chari, & A. Sreenivasan
	10	Marketing and Utilization of Shrimp in the United States, by D. M. Clifford.
	11	Observations upon the Biology, Ecology and Life-history of the Common Shrimp, *Peneus setiferus* (Linn.) along the South Atlantic and Gulf Coasts of the United States, by W. W. Anderson.
	12	A Review of the Biology and Systematics of Shrimps and Prawns of Japan, by I. Kubo.
	12 (Corr. 1)	Ditto.
	13	Fluctuations in Australian Prawn Catch, by J. M. Thomson.
	14	Shrimp and Prawn Fisheries in Indonesia with Special Reference to Those in Kroya District, by R. R. Djajadiredja and M. Sachlan.
	15	Floating Shrimp Traps in the Deltaic Area of Burma, by U Ba Kyaw.
	16	Shrimps of the Seto Inland Sea of Japan, by J. Yasuda.
	17	The Validity of the Generic names of Penaeid Prawns, by D. N. F. Hall.
	18	Prawn Culture in the Rice fields of Travancore-Cochin, India, by K. Gopinath.

CAL PAPERS
AND FISHERIES)

5/TECH	1	Experimentations in the Brackish-water Ponds at Polagan, Madura, East Java, by A Djaingsastro.
	2	Some Notes on Adult Chanos, by R. Mardjoko Tjiptoaminoto.
	3	On the Feeding Habits of the Young Larvae of Fresh-water and Marine Fishes, by R. Sato.

IPFC/C55/TECH 4 Food and Feeding Habits of Fresh-water Fishes of Madras State, by M. D. M P. I Chacko.

5 Fish Transplantation to East Pakistan, by N. Ahmad.

6 Observations of Tilapia Culture in North Borneo, by Chin Phui Kong.

7 Cultivation of Common Carp in Running Water in West Java, by K. F. M. Sachlan.

8 Production of *Tilapia mossambica* in an Experimental Pond at Bangkhen, Tha U. Pongsuwana.

(SEA FISHERIES)

9 Some Notes on Tuna and Tuna-like Fishes in Indonesian Waters, by J. R. Pattinasa

10 Longline Fishing Ground for Tunas in the Indian Ocean, by H. Nakamura, Y. Y K. Himura.

11 Deep Scattering Layer as an Indicator of Fishing Grounds, by M. Uda.

12 Shoaling Tendency in Tuna Observed in the Great Sunda Archipelago, by H. Jaed

13 Sea Fisheries Resources in Japan, by Z. Nakai.

13 (Corr. 1) Ditto.

(MISCELLANEOUS)

Note.—See also papers under Symposium series.

IPFC/C55/TECH 14 A Note on the Oceanographical Investigations and Related Activities in Japan, by N. Watanabe.

15 Recent Trends in Planktonological Researches in Japan, by Z. Nakai.

16 Correlation of Hydrographic and Meteorological Features with the Fluctuations i fisheries in the Waters off Japan, by M. Uda.

17 Methods of Gathering Evidence of Basic Changes in Marine Faunal Distribu A. R. Margetts.

18 The Singapore Regional Fisheries Research Station, by F. D. Ommanney.

19 Plankton Associations around Japan, by S. Motoda.

20 Pearl Industry and Research in Japan, by S. Y. Okada.

21 Fluctuations in the Distribution of Sardine due to Oceanographic Conditions in the by Z. Nakai.

(CRAFT AND GEAR)

22 The Use of Indigenous and Imported Materials in Fishing Gear Construction in th pines, by A. F. Umali.

23 Fishing Gear in Indonesia, by The National IPFC Committee of Indonesia.

24 Stationary Lift-net (San-Da-Gyi) Fishery in the Mergui District, Burma, by U Ba K

25 Trawling Results of *Taiya Maru No.* 11 in Burmese Waters, by U Ba Kyaw.

26 Use of Synthetic Fibre for Fishing Nets and Rope in Japan, by H. Miyamoto.

26 (Corr. 1) Ditto.

27 Fishing with Light in Japan, by S. Takayama.

28 Do Fishing Lights Affect the Fish Population ?, by Z. Nakai.

28 (Corr. 1) Ditto.

D TECHNOLOGY)

/TECH 29 Studies on the Bleaching and Utilization of Gulaman-dagat (*Gracilaria confervoides*), by J. I. Sulit, L. G. Salcedo & P. C. Panganiban.

30 Preparation of Galangong (*Decapterus macrosoma*) Fish Meal and its Nutritive Value, by O. N. Gonzalez, S. V. Bersamin and J. I. Sulit.

31 Note sur la Conservation du Poisson Sale-seche sous Emballage de Polyethylene, par R. Lafont.
(Note on the Preservation of Dried-salted Fish on Polyethylene Containers), by R. Lafont.

32 La Concentration des Sauces de Poisson Valeur Alimentaire du Concentre, par R. Lafont.

(A New method of Concentrating Fish Sauces), by R. Lafont.

33 Note sur l'Utilisation des Dechets de Poissons pour la Fabrication de Farine Alimentaire pour les Animaux, par R. Lafont.

(Utilization of Fish Waste for the Manufacture of Fish Meal), by R. Lafont.

34 The 'Rusting' of Fish Oil and Preventive Measures against the Rusting of Dehydrated Fish Products, by J. Nonaka.

35 Insecticides for Dehydrated Fish Products, by J. Nonaka.

36 Chemical Preservation of Marine Products, by S. Tetsumoto, T. Okitsu and M. Fukuta.

37 Refrigeration of Fish on Boats in Japan, by K. Tanaka.

IO-ECONOMICS AND STATISTICS)

38 Fish Marketing in Thailand, by S. Bandhukul.

39 Progress of Fisheries Statistics in Japan, by T. Yamamoto.

40 Some Basic Problems in the Development of Fisheries Statistics in Japan, by N. Oka.

MENTARY LIST

41 A Glimpse of the Fisheries in Burma, by U Ba Kyaw.

42 A Brief Review of Recent Studies of Faunal and Climatic Changes in North America, with Special Reference to Marine Animals, by J. C. Marr.

43 The Inland Fisheries Extension Services in Indonesia, by M. Ahjar.

44 The Relative Importance of Subsistence Fishing, by M. Ahjar.

45 Co-operative Marketing Organization in Indonesia with Reference to the Eratan Co-operative Fish Auction System in West Java, by Eddiwan.

46 The Significance of Fish Culture as an Integral Part of Rural Economy in Indonesia, by M. Ahjar and R. Tasripin.

47 Fishery Development in Indonesia during 1945-55, by The Indonesian Delegation.

48 The Role of the World Meteorological Organization in Providing Weather Information for Fishermen, by The World Meteorological Organization.

49 Small Mesh Trawling in Papua, by A. M. Rapson.

50 A Preliminary Systematic Study of the Philippine Chub Mackerels, Family Scombridae, Genera Pneumatophoros and Rastrelliger, by P. R. Manacop.

51 Rice Straw Net & Rope as Indigenous Materials, by S. Takayama.

52 Excellent Reference Materials for the Research of the Fish Gathering Lamp, by The Japanese Fisheries Agency.

53 Significance of Fish Culture as an Integral Part of Philippine Rural Economy, by P. A. Acosta.

IPFC/C55/TECH	54	Observations on Fishing with Light in the Philippines, by S. B. Rasalan and B. Dat
	55	Current Status of Uses of Fish Finders in Japan, by S. Kawata.
	56	Record of our Experience on Raising Tilapia in Hot-spring Water, by K. Kuron Nakamura & T. Maruyama.

INCIDENTIAL PAPERS

IPFC/C55/INC	1	List of Delegates and Observers.
	2	List of Documents.
	3	List of Fisheries Films of Interest to the Indo-Pacific Countries in Addition to Thc nished in the List Issued by FAO in 1953.
	4	General Information.
	5	Provisional Schedule of the Session.
	6	Order of the Day (Sept. 30th).
	7	Side Tour to Misaki Fishing Port.
	8	Opening Statements of Delegates and Observers.

CONTRIBUTED PUBLICATIONS

IPFC/C55/CP	1	Selected Bibliography on Fisheries Published in Japan During the Year 1954, by K numa, IPFC Occasional Paper No. 55/4.
CP	2	Fishery Bibliography Relating to India for 1954, by C. P. Gnanamuthu, IPFC Oc Paper No. 55/5.
CP	3	General Fisheries Council for the Mediterranenan Proceedings and Technical Papers FAO, Rome, 1955.
CP	4	The Technology of Herring Utilization—Report of the FAO Meeting on Herring Tecl Bergen, Norway, 24-29th Sept. 1950. Fiskeridirektoratets Skrifter, Serie Fisk 1953.
CP	5	Progress Report of the California Co-operative Oceanic Fisheries Investigation, 1952
CP	6	Key for the Field Identification of the Common Clupeoid Fishes of India, by R. *J. Zool. Soc. India*, 5(1): 108-138, 1953.
CP	7	Preservation of Semi-dried Prawns, by R. Venkataraman, A. Sreenivasan and A. G. *J. Sci. Ind. Res.* 12*A* (10): 473-474, 1953.
CP	8	The Contribution of Oceanographic Research to Fisheries Science, by G. L. Keste G. E. R. Deacon. *FAO Fisheries Bulletin*, 8 (2), *April-June*, 1955.
CP	9	Fish and Fisheries of the Mahanadi in Relation to the Hirakud Dam, by T. J. Job, and K. N. Das. *Ind. J. Fish.*, 2, 1-36, 1955.
CP	10	Fish and Fisheries, by N. K. Panikkar, *Prog. Sci. Ind., Sect. VII, Zool.* (Incomp
CP	11	Some Basic Economic Problems of Fishery Development in South and East Asia, F Paper No. 6.
CP	12	The Development of Ceylon's Fishing Industry, by E. R. A. de Zylva—*Bom. J. N Soc.*, 52(1): *April*, 1954.
CP	13	Report on the IPFC Training Center, Bangkok, Thailand, June, 1952, by Dr. G.L. K FAO Report 357 (Mimeo)
CP	14	South Pacific Commission—Extract from Report of 7th Meeting—Research Counc 1955—Fisheries.
CP	15	South Pacific Quarterly Bulletin 5(3): July, 1955.

5/CP	16	Fisheries Bibliography for Indonesia, January 1954—April 1955, by H. Saanin, IPFC Occasional Paper No. 55/6.
CP	17	Report to the Government of Ceylon on the Mechanization of Fishing Operations, by A. Glanville, FAO Report 284, July 1954 (Mimeo)
CP	18	Improving the Fisheries Contribution to World Food Supplies—*FAO Fish. Bull., Vol.* (5): *Sept.-Oct.* 1953.
CP	19	Japanese Fisheries (Handbook)
CP	20	Annual Report of the Chief Research Officer for the Year Ending 31st March 1954—Government of India, Central Marine Fisheries Research Station, Mandapam Camp.
CP	21	Note on Recent Oceanographic Work in India, by N. K. Panikkar & M. B. Ramachandra Rao, *A.I.O.P. Proc-Verb., No.* 6, 1955.
CP	22	Some Aspects of Adaptation in *Chanos chanos* (Forskal), by N. K. Panikkar, P. R. S. Tampi and R. Viswanathan, *Proc. Ind. Acad. Sci.*, 37(6)*B.* 203-213, 1953.
CP	23	Government of India Central Marine Fisheries Research Station, Mandapam. *Ind. J. Fish.*, 1(1 & 2): 365-376, 1954.
CP	24	Annual Report of the Chief Research Officer, Govt. of India Central Marine Fisheries Research Station, Mandapam, *Ind. J. Fish.*, 1 (1 & 2): 377-401, 1954.
CP	25	On the Mouth-Breeding Cichlid, *Tilapia Mossambica* PETERS, by N. K. Panikkar and P. R. S. Tampi, *J. Fish.*, 1(1 & 2): 217-230, 1954.
CP	26	Fish Culture in Paddy Fields in the Federation of Malaya, by Soong Min Kong, FAO International Rice Commission 4th Session, Tokyo, Japan, 11-19 Oct. 1954 (Mimeo).
CP	27	What I Hear about the Spawning of Grass-Carp in the Tone-River, Japan, by K. Kuronuma (Mimeo).
CP	28	Fish and Aquatic Insect Entering Water Diversion and an Experiment of Fish-Refuge-Pool, by K. Kuronuma and H. Okubo, *Bulletin Freshwater Research Lab. Vol.* 1(1).
CP	29	Appraisal re Introduction of Foreign Fishing Technique, by S. Takayama, Tokai Regional Fisheries Research Laboratory, Tokyo, Japan (Mimeo)
CP	30	How to Motorize Small Fishing Boats—Inboard engine or outboard engine ?, by S. Takayama, Tokai Regional Fisheries Research Laboratory, Tokyo, Japan (Mimeo).
CP	31	Carp Culture in Rice Fields as a Side Work of Japanese Farmers, by K. Kuronuma, Freshwater Fisheries Research Laboratory, Min. of Agric. & Forestry, Japanese Government Oct. 1954.
CP	32	Japanese Whaling Industry, by Fisheries Agency, Min. of Agric & Forestry, 1954.
CP	33	Annual Report of Catch Statistics on Fishery and Aquiculture, Stats. Surv. Div., Min. Agric. & Forestry, Japanese Govt., Sept. 1955.
CP	34	Prawn Trawling Gear in Australian Ocean Waters, by A. O'Grady, C.M.O., Sydney.
CP	35	FAO Report 404—on the first FAO/ETAP International Fish Marketing Training Centre, Hong Kong, 11 July-31 Aug. 1954.
CP	36	A Note on the Fisheries Resources of the North West Atlantic, by G. L. Kesteven & S. J. Holt, FAO Fisheries Paper No. 7, June 1955.
CP	37	FAO Plans for a World Survey of Living Aquatic Resources, *FAO Fish., Bull.*, 8(4). *Oct.-Dec.* 1955.
CP	38	Bibliography of Fishes in Japan 1612-1950, by Y. Okada and K. Matsubara, Faculty of Fish, Prefectural University of Mie, Japan, 1953.
CP	39	Progress Report of the Co-operative Iwashi Resources Investigations : April 1949-December 1951, Fisheries Agency, Tokai Regional Fisheries Research Laboratory, Tokyo, Sept. 1955.

CP 40 Outline of Weather Information to Fisherman in Japan, Central Meteorological vatory, Japan (Mimeo).

CP 41 FAO Report 403 to the Government of Pakistan on Mechanization of West Pakistan Boats, FAO, Sept. 1955.

CP 42 Progress Report for the Fisheries Research Station, Colombo, Biology of *Lethrin losus*.

CP 43 Records of Oceanographic Works in Japan—Vol. 2(2) : Oct. 1955.

CP 44 Records of Oceanographic Works in Japan—Vol. 2(3) : Oct. 1955.

CP 45 Tilapia and its Culture—A preliminary bibliography, by P. Chimits, *FAO Fish. Bu Jan.-March*, 1955.

IPFC Publications :

1. IPFC Agreement, Rules of Procedure and Terms of Reference of the Technical Committees, Revised, Ja
2. IPFC Proceedings, 5th Session, Bangkok, Thailand, 22nd Jan.-5th Feb. 1954, Section 1, 1954.
3. IPFC Proceedings, 5th Session, Bangkok, Thailand, 22nd Jan.-5th Feb. 1954, Section II, 1954.
4. Symposium on Marine and Freshwater Plankton in the Indo-Pacific, Bangkok, Jan. 25-26, 1954, Jo lication of FAO (IPFC) and UNESCO, 1952.

Press Releases :

IPFC/C55/P 1 Message from the Director-General of the Food & Agriculture Organization of the United Dr. P. V. Cardon, by Mr. R. H. Fiedler, Fisheries Division, FAO, Rome, Italy.

P 2 Request by Mr. Boon Indrambarya, Chairman of the IPFC to H. E. The Minister of Ag & Forestry to open the Session.

P 3 Opening Address by Honourable Mr. I. Kono, Minister of Agriculture and Forestry at th Session of the Indo-Pacific Fisheries Council, Tokyo, Japan, 30 September 1955.

P 4 Message by the Honourable the Foreign Minister, Mr. M. Shigemitsu to the Sixth Sessio IPFC.

INDO PACIFIC FISHERIES EXHIBITION CATALOGUE

"インド・太平洋漁業展" 出品目録

社　名 / XHIBITOR: 株式会社　日立製作所 / HITACHI CO., LTD.
所 / DDRESS: 東京都千代田区丸の内1の4新丸ビル / NO. 4 1-CHOME, MARUNOUCHI, CHIYODA-KU TOKYO
話番号 / IONE: (27) 0111　0211　0311　1111
品　物 / XHIBITS: アンモニア冷凍機　遠心清浄機

社　名 / XHIBTOR: 新三菱重工業株式会社 / MITUBISHI HEAVY-INDUSTRIE-S, REORGANIZED, LIMITED
所 / DDRESS: 東京都千代田区丸の内2の14 / NO. 14 2-CHOME MAUNOUCHI C HIYODA-KU TOKYO
話番号 / IONE: (28) 1181
品　物 / IBITS: 多気筒冷凍機（8気筒）

社　名 / HIBITOR: 三菱電機株式会社 / MITUBISHI ELECTRIC MFG. CO., LTD.
所 / DDRESS: 東京都千代田区丸の内2の3 / NO. 3 2-CHOME MARUNOUCHI CHIYODA-KU TOKYO
話番号 / ONE: (20) 1613　2231
品　物 / HIBITS: MA—8F 冷凍機 / MA—4B型, MA—6B型 / S型 V型 圧縮機

社　名 / HIBITOR: 大阪金属工業株式会社 / OSAKA KINZOKU KOGYO CO., LTD.
所 / DRESS: 大阪市北区梅田町47　（新阪神ビル9階） / NO. 47 UMEDACHO KITAKU OSAKA
話番号 / ONEE: (45) 7851～7855
品　物 / HIBITS: ダイキン冷凍機 8MB—70型 ユニット

会社名 / EXHIBITOR: 東洋キヤリア工業株式会社 / TOKYO CARRIER ENGINERING CO., LTD.
住所 / ADDRESS: 東京都中央区日本橋兜町3の24 / NO. 24 3-CHOME KABUTOCHO NIHONBASHI CHO-KU TOKYO
電話番号 / PHONE: (67) 2166
出品物 / EXHIBITS: 冷凍機　5H40型　20馬力

会社名 / EXHIBITOR: 大日本水産 / FISHERIES SOCITY OF JAPAN
住所 / ADDRESS: 東京都千代田区丸の内2の2（丸ビル6階 624号） / NO. 2 2-CHOME MARUNOUCHI CHIYODA-KU TOKYO
電話番号 / PHONE: (20) 1970～1979
出品物 / EXHIBITS: 参加会社名
日本冷蔵株式会社　大洋漁業株式会社
日本水産株式会社　極洋捕鯨株式会社
日魯漁業株式会社

会社名 / EXHIBITOR: 社団法人日本舶用発動機会 / THE MARINE INTERNAL COMBUSTION MANUFACTURERS ASSO OF JAPAN
住所 / ADDRESS: 東京都中央区日本橋呉服橋3の5 槇町ビル6階 / ON. 5 3-CHOME GOFUKUBASHI NIHONBASHI CHUO-KU TOKYO
電話番号 / PHONE: (27) 9761
出品物 / EXHIBITS: 参加会社名
鐘淵ディーゼル工業株式会社
株式会社サクション瓦斯機関製作所
株式会社鶴山製作所
池貝鉄工株式会社
三菱日本重工株式会社
株式会社新潟鉄工所
株式会社電業社機械製作所
株式会社伊藤鉄工所
株式会社赤坂鉄工所
株式会社住吉鉄工所
株式会社松井鉄工所

株式会社柳原鉄工所
新三菱重工業株式会社
ダイハツ工業株式会社
ヤンマーディーゼル株式会社
久保田鉄工株式会社
阪神内機工業株式会社
日本発動機株式会社
神戸発動機株式会社
株式会社木下鉄工所
株式会社横田鉄工所
松江内燃工業株式会社
株式会社臼杵鉄工所
三菱造船株式会社

会社名 EXHIBITOR: 板沢漁機工業株式会社 ITAZAWA GYOKI KOGYO CO., LTD.

住所 ADDRESS: 横浜市鶴見区鶴見町1209 NO. 1209 TSURUMICHO TSURUMI-KU YOKOHAMA

電話番号 PHONE: (5) 2891 4347

出品物 EXHIBITS: プロペラ

会社名 EXHIBITOR: 株式会社臼杵鉄工所 USUKI IRON WORKS, CO., LTD.

住所 ADDRESS: 大分県臼杵市 USUKI-CITY, OITA-PREF., 東京事務所. 東京都千代田区丸の内鉄鋼ビル TOKYO OFFICE: TEKKO BLDG., MARUNOUCHI CYIYODA-KU TOKYO

電話番号 PHONE: TOKY OFFICE (20) 2698 0078

出品物 EXHIBITS: 船舶用ディーゼル機関模型
米国型巾着網漁船模型
鮪延縄漁船模型
鮭の流し網漁船模型
SCALE MODEL OF MARINE DIESEL ENGINE
SCALE MODEL OF U.S. TYPE - PURSE SEINER
SCALE MODEL OF LONG LINE-TUNA CLIPPER
SCALE MODEL OF GILL & DRAG NET TRAWLER

会社名 EXHIBITOR: 株式会社安川電機製作所 YASUKAWA ELECTRIC CO., LTD.

住所 ADDRESS: 東京都中央区銀座7の1 NO. 1 7-CHOME GINZA CHUO-KU TOKYO

電話番号 PHONE: (57) 4961

出品物 EXHIBITS: 漁船用 US カップリング

会社名 EXHIBITOR: 日東電気株式会社 NITTOH ELECTRIC CO., LTD.

住所 ADDRESS: 東京都新宿区四ッ谷4の24 NO. 24 4-CHOME YOTUYA SHINJYUKU-KU TOKYO

電話番号 PHONE: (35) 3327

出品物 EXHIBITS: 魚群探知機
漁業用高周波螢光灯

会社名 EXHIBITOR: 株式会社東京計器製造所 TOKYO KEIKI SEIZOSHO CO., LTD.

住所 ADDRESS: 東京都大田区東蒲田4の31 NO. 31 4-CHOME HIGASHIKAMATA OTA-KU TOKYO

電話番号 PHONE: (73) 2211

出品物 EXHIBITTS: T.K.Sレーダー MR—30型
SM_2 磁気羅針機
M.C.P（磁気自動操舵装置）

会社名 EXHIBITOR: 兼松特殊工業株式会社

住所 ADDRESS: 名古屋市北区東大曽根町上1の810 NO. 810 1-CHOME OSONECHO KITA-KU NAGOYA-CITY JAPA

電話番号 PHONE: 東 (4) 4933 EAST (4) 4933

出品物 EXHIBITS: 魚獲用衝撃電圧発生機，配電盤，ウイト，巻上機，附属品として（ロー類その他）

会社名 EXHITOR: ヤンマーディーゼル株式会社 YANMAR DIESEL ENGINE CO LTD.

住所 ADDRESS: 大阪市北区茶屋町62 NO. 62 CHAYACHO KITA-KU OSAKA

電話番号 PHONE: 豊崎 (37) 10. 131～134 TOYOSAKI (37) 10. 131～134

出品物 EXHIBITS: ヤンマー KI型 ディーゼルエンジン型写真

社　名　新三菱重工業株式会社
HIBITOR　MITSUBISHI HEAVY-INDUSTRI-LS, REORGANIZE, LIMITED

所　東京都千代田区丸の内2の4
DRESS　NO. 4 2-CHOME MARUNOUCHI CHIYODA-KU TOKYO

話番号　(28) 1181
ONE

品　物　三菱ダイヤディーゼル. 3DVA—3a型多気筒冷凍機
HIBITS

社　名　株式会社赤坂鉄工所
HIBITOR　AKASAKA IRON WORKS CO., LTD.

所　東京都中央区銀座6の3
DRESS　NO. 3 6-CHOME GINZA CHUO-KU TOKYO

話番号　(57) 6489
ONE

品　物　陸舶用ディーゼル機関（50馬力～3000馬力
HIBITS　50B. H. P-3000B. H. P AKASAKA DIESEL ENGINE FOR MARINE AND LAND USE

社　名　日本電気株式会社
HIBITOR　NIPPON ELECTRIC CO., LTD.

所　東京都港区三田四国町2
DRESS　NO. 2 SHIKOKUCHO MITA MINATO-KU TOKYO

話番号　(45) 1171～1179
ONE

品　物　NEC船舶無船装置用真空管
HIBITS　熱陰極水銀蒸気整流管4H72
空冷管 4P60. 5P70. P250. 5F23A
RAP—261型通信用受信機
船舶用無電地式電話機
8990—A型完全防水壁掛型（片耳）直通用
8993—A型無防水卓上型（1対5用）
4号自動式電話機
新型電話機
精密音響測探機
JSCR—536—F 携帯用短波無線電話機
JSCR—300—B 背負型超短波無線電話機
TUBES FOR NEC RADIO EQUIPMENT FORCED-AIR CALL TYPE
4P60. 5P70. P250. 5F23A
TYPE RAP-261 COMMUNICATION RECIEVER
8990-A WALL TYPE MARINE TELEPHON
(WATER-PROOFED)
(TO BE CONECTED TO 1 TELEPHON)
8993-ATABLE TYPE MARINE TELEPHON
(NON-WATER PROOFED)
(TO BE CONNECTED TO 5 TELEPHON)
NO4 AUTOMATIC DESK TYPE TELEPHON SET
NO. 8365-A NEW TYPE AUTOMATIC TELEPHON SET
TYPE SD-311A PRECISION ECHO SOUNDER
JSCR-539-F RADIO SET (HANDIE-TALKLE)
JSCR-300-B RADIO SET (WALKIE-TALKLE)

会社名　安立電気株式会社
EXHIBITOR　ANRITRU ELECTRIC CO, LTD.

住所　東京都港区麻布富士見町39
ADDRESS　NO. 39 FUJIMICHO AZABU MINATO-KU TOKYO

電話番号　(45) 2131～2138
PHONE

出品物　ART-5330型 75W送信機
EXHIBITS　ART-5222型 150W送信機
ARS-5403型 FM電話装置
ARS-5501-A型 27MC受信機
ARR-5403型 8球全電波受信機
TYPE ART-5330 75W RADIO TRANSMITTER
TYPE ART-5222 150W RADIO TRANSMITTER
TYPE ARS-5403 FM RADIO TRANSMITTER
TYPE ARS-5501A 27MC RADIO TRANSMITTER RECEIVER
TYPE ARR-5403 WAVE RECEIVER

会社名　東洋通信機株式会社
EXHIBITOR　TOKYO COMMUNICATION EQUIPMENT CO., LTD.

住所　東京都千代田区霞ケ関3の3
ADDRESS　NO. 3 3-CHOME KASUMIGASEKI CHIYODA-KU TOKYO

電話番号　(23) 1973
PHONE

出品物　E2015 MS型 150W無線電信電話送信機
EXHIBITS　TEM-68型 35W無線電信電話送信機
RT2006/SV型 漁業用 27MC帯無線電話装置
RFS-1011型 10球長中波受信機

オーバートン水晶振動子
TYPE T2015/MS 150W RADIO TELEGRAPH EQUIPMENT
TYPE TEM-68 35W RADIO TRANSMITTER
TYPE RT2006/SV 27MC RADIO TRANSMITTER-RECEIVER
TYPE RFS-1011 10-TUBE LONG AND MEDIUM WAVE RECEIVER
OVER- TONE CRYSTAL OSCILATER

会社名 EXHIBITOR: 旭電気株式会社 ASAHI DENKI KOGYO K.K.
住所 ADDRESS: 横浜市西区北幸町1の35 NO.35 1-COME KITASAIWAICHO NISHI-KU YOKOHAMA
電話番号 PHONO: 神奈川 0335 KANAGAWA 0335
出品物 EXHIBITS: SC-761 VHF FISHERY USE
SC-760A VHF FISHERY USE
EC-550A RANGEFINDER
RANGEFINDER

会社名 EXHIBITOR: 海上電気株式会社 MARINE INSTRUMENT CO.,LTD.
住所 ADDRESS: 東京都千代田区神田錦町1の19 NO.19 1-CHOME NISHIKICHO KANDA CHIYODA-KU TOKYO
電話番号 PHONE: (25) 0856
出品物 EXHIBITS: FISH CAMERA
FISH GRAPH
TYPE 103-B ECHO SOUNDER

会社名 EXHIBITOR: 古野電氣株式会社 FURUNO ELECTRIC CO.,LTD.
住所 ADDRESS: 長崎市大黒町85 NO.85DAIKOKUCHO NAGASAKI-CITY JAPAN
電話番号 PHONE: 長崎 2539 NAGASAKI 2539
出品物 EXHIBITS: 魚群探知機 FISH FINDER

会社名 EXHIBITOR: 水産電波株式会社 SUISAN DEMPA K.K.
住所 ADDRESS: 東京都中央区日本橋江戸橋1の15 NO.15 1-CHOME EDOBASHI NIHONBASHI CHUO-KU TOKYO
電話番号 PHONE: (27) 8984
出品物 EXHIBITS: 無線通信機

会社名 EXHIBITOR: 株式会社 産 研 SANKEN CO.,LTD.
住所 ADDRESS: 静岡県沼津市千本郷林1907 NO.1907 SENBONGORIN NUMAZUCITY SHIZUOKA-PREF
電話番号 PHPNE: 沼津 1626 NUMAZU 1626
出品物 EXHIBITS: 記録式魚群探知機（産研スーパーグラフ）
映像式魚群探知機（産研テレビ式）
記録映像併用式魚群探知機（産研テレビグラフ）
精密音響測深機（産研P.D.R2型）

会社名 EXHIBITOR: 株式会社光電製作所 KODEN ELECTRONICS CO.,LTD
住所 ADDRESS: 東京都品川区上大崎長者丸284の1 NO.284 CHOJYAMARU KAMIOSAKI SHINAGAWA-KU TOKYO
電話番号 PHONE: (49) 3265. 7438
出品物 EXHIBITS: KS-262V型無線方位測定機
RADIO DIRECTION FINDER TYPE KS-262U

会社名 EXHIBITOR: 大洋無線株式会社 TAIYO RADIO CO.,LTD.
住所 ADDRESS: 東京都澁谷区衆楽町48 NO.48 SHIYURAKUCHO SHIBYA-KU TOKYO
電話番号 PHONE: (49) 5283～9
出品物 EXHIBITS: 自動方向探知機
ブラウン管式向探知機

会社名 EXHIBITOR: 双葉理工株式会社 FUTABA-RIKOH CO.,LTD.
住所 ADDRESS: 東京都中野区多田町42 NO.42 TADACHO NAKANO-KU TOKYO
電話番号 PHONO: (38) 5592
出品物 EXHIBITS: 魚群探知機
FISH FINDER

会社名 EXHIBITOR: 神戸工業株式会社 KOBE KOGYO CO.,LTD.
住所 ADDRESS: 神戸市兵庫区和田山通1の5 NO.5 1-CHOME WADAYAMAORI HYOGO-KU COBE-CITY
電話番号 PHONE: 湊川 5 MINATOGAWA 5

品　物
HIBITS
150WATT TRANSMITTER
80WATT TRANSMITTER
ALL WAVE RECEIVER
SURVEY METTER
TRANSMITTING TUBE

社　名
HIBITOR
双葉魚探機株式会社
FUTABA FISH FINDER CO. LTD.

所
DRESS
東京都千代田区神田末広町25
NO. 25 KANDA-SUEHIROCHO C-HIYODA-KU TOKYO

話番号
ONE
(25) 2116～9

品　物
HIBITS
音響測探機
魚群探知機
電氣水温計
漁船用磁氣羅針儀
SUPERSONIC ECHO SOUNDER
FISH FINDER
ELECTRIC THERMOMETTER
MAGNETIC COMPASS FOR FISHING BOATS

社　名
HIBITOR
株式会社島田硝子研究所
SHIMADA GLASS WORKS, CO., LTD.

所
DRESS
東京都大田区山王1の2867
NO. 2867 1-CHOME SANO OTA-KU TOKYO

話番号
ONE
(76) 9657

品　物
HIBITS
殺菌燈とその水産分野での應用に関する資料
集魚用に利用されている各種電球
雑品．魚つり具

社　名
HIBITOR
住友商事株式会社東京支社
SUMITOMO SHOJI KAISHA LTD TOKYO BRANCH

所
DRESS
東京都中央区日本橋通1の2
NO. 2 1-CHOME NIHONBASHI C-HUO-KU TOKYO

話番号
ONE
(27) 5551

品　物
HIBITS
流速．流向．水温．測定用CM-3型電氣潮流計
DIRECT-READING CURRENT METTER, MODEL CM-3

社　名
HIBITOR
株式会社科学研究所
SCIENTIFIC RESEACH INSTITUTE, CO., LTD.

所
DRESS
東京都文京区駒込富士見町31
NO. 31 FUJIMICHO KOMAGOME BUNKYO-KU TOKYO

電話番号
PHONE
(94) 1131～10

出品物
EXHIBITS
科研電磁式海流計
科研海底写真機
科研水中カメラ
船舶用ガイガーカウンター

会社名
EXHIBITOR
神戸電氣株式会社
KOBE ELECTRIC MACHINERY CO., LTD,

住所
ADDRESS
大阪市大淀区浦江北5の15
NO. 15 5-CHOME URAEKITA O-YODO-KU OSAKA

TOKYOBLDG
東京事務所東京都港区芝新町2の1
NO. 1 2-CHOME SHIBASHINMA-CHI MINATO-KU TOKYO

電話番号
PHONE
TOKYO BLDG (57) 2235. 1943
2862

出品物
EXHIBITS
集魚灯
集魚灯用電池
バッテライト
FISH LURING LIGHT
STRAGE BATTERY FOR FISH LURING LIGHT BATTELIGHT

会社名
EXHIBITOR
海王潜水機株式会社
KAIO DIVING OUTFIT MFG CO. INC.

住所
ADDRESS
東京都千代田区神田元岩井町11
(日加工業ビル)
NIKKA BUILDING NO11 MOTOI-WAICHO KANDA CHIYODA-KU TOKYO

電話番号
PHONE
(66) 4456

出品物
EXHIBITS
潜水機械一型A
潜水機一型C
潜水機二型（ボンベ式）
潜水服

会社名
EXHIBITOR
日本魚函サービス株式会社
NIPPON FISH CAN SERVICE CO., LTD.

住所
ADDRESS
東京都千代田区内幸町2の3（幸ビル）
SAIWAI BLDG, NO. 3 2CHOME UCHISAIWAICHO CHIYODAKU TOKYO

電話番号
PHONE
(59) 6525

出品物
EXHIBITS
金属製保鮮魚函

会社名 EXHIBITOR
東亜潜水機株式会社
TOA DIVING APPARATUS CO., LTD.

住所 ADDRESS
東京都荒川区南千住8の96
NO. 96 8-CHOME MINAMI-SENJU ARAKAWA-KU TOKYO

電話番号 PHONE
(84) 2334, 611

出品物 EXHIBITS
潜水機高圧コンプレッサー，バルメート式，装具アクアラング式

会社名 EXHIBITOR
株式会社小泉X線工社
KOIZUMI X-RAY PRODUCTS CO., LTD.

住所 ADDRESS
東京都世田谷区北沢4の327
NO. 327 4-CHOME KITAZAWA SETAGAYAKU TOKYO

電話番号 PHONE
(42) 0596. 2353

出品物 EXHIBITS
ソフテックス（超軟X線発生装置）
SOFTEX (SOFTEX-RAY UNIT)

会社名 EXHIBITOR
株式会社 離 合 社
RIGOSHA CO., LTD.

住所 ADDRESS
東京都千代田区神田鍛冶町1の2
NO. 2 1-CHOME KAJICHO KANDA CHIYODA-KU TOKYO

電話番号 PHONE
(25) 0773. 1513

出品物 EXHIBITS
ナンゼン顛倒採水器 他
各層採水機 他

会社名 EXHIBITOR
日本水産機械工業協同組合
NIPPON SUISAN KIKAI K. K.

住所 ADDRESS
東京都千代田区神田司町1の10
NO. 10 1 CHOME KANDA-TUKASAMACHI CHIYODA-KU TOKYO

電話番号 PHONE
(25) 4803

出品物 EXHIBITS
鮪延縄捲上機・捕鯨砲・ロープ投射器
ガラス浮玉・錨・電気浮標灯・カーバイトランプ
TONA LONGLINE HAULER WHALING HARPOON GUN. LINE THROWING APPARATUS GLASS FLOATER. ANCHER FLOATING LANP CARBID LAMP

会社名 EXHIBITOR
株式会社鶴見精機製作所
TSURUMI SEIKI KOSAKUSHO CO., LTD.

住所 ADDRESS
横浜市鶴見区鶴見町1, 506
NO. 1506 TSURUMI-MACHI TSURUMI-KU YOCOHAMA

電話番号 PHONE
(5) 2028・6656

出品物 EXHIBITS
エクマンメルツ流速計
TS 自記流向流速計
TS-RBT 自記流向流速計
TS 小型流速計（漁船用）
TS 携帯用捲上機
TS 魚体長測定記録器（A型）
〃 〃 （B型）
TS 水深水温記録器
TS 水 色 計
TS 透明顛倒採水器
顛例枠（顛倒寒暖計用）
TS 濾水計（プランクトンネット用
六号深度計
CURRENT METER (EKMEN
MERZ TYPE)
SELF-RECORDING CURRENT
METER (T.S. TYPE)
T.S.-RBT, TYPE, SELF-RECO
DING CURRENT METER
T.S. SMALL TYPE, CURRE
METER FOR FISH BOAT
T.S. PORTABLE WINCH
T.S. MEASURE RECORDER F
FISH (A. TYPE)
T.S. MEASURE RECORDER F
FISH (B. TYPE)
T.S. BATHYTERMOGRAPH
COLOUR STADARD FOR S
WATER (T.S. TOMEI (TRENS
ERENCY) TYPE
REVERSING FRAME FOR REV
KSING THERMO-METER
PLANKTON METER T.S. TY
DEPTH GAUGE NO. 6

会社名 EXHIBITOR
山下釣具製作所

住所 ADDRESS
神奈川県三浦市三崎町花暮 141
NO. 151 HANAKURE MISAKI-C
MIURA-SHI KANAGAWA-PRE

電話番号 PHONE
三浦 (MIURA) 349

出品物 EXHIBITS
ビニール製擬似飾(ゴールデンベイ
カツオ・マグロ・竿釣・曳縄用カ

会社名 EXHIBITOR
東光化工株式会社
TOCO CHEMICAL INDSTRY C
LTD.

住所 ADDRESS
本社 東京都墨田区緑町2の4
工場 神奈川県逗子市逗子 641
(HEAD OFFICE) 4~2CHOME M
DORI-CHO SUMIDA-KU TOK
(FACTORY) 641 ZUSI-CITY K
NAGAWA-PREF

話番号 (63) 2976
ONE
工場 (FACTORY) 逗子 (ZUSI) 107
品物
HIBITS

社名 倉敷レイヨン株式会社
HIBITOR KURASIKI RAYON CO., LTD.
所 大阪市北区梅田町2 第一生命ビル内
DRESS NO. 2 UMEDAMACHI KITA-KU OSAKA
話番号 OSAKA (45) 7031～8
ONE
品物 漁網 ロープ
HIBITS FISHING NETS
FISHING LINE
FISHING ROPE

社名 呉羽化学株式会社
HIBITOR KUREHA KASEI CO., LTD.
所 東京都千代田区神田材木町1
DRESS NO. 1 ZAIMOKUCHO KANDA CHIYODA-KU TOKYO
話番号 (66) 3101～9
ONE
品物 クレハロン漁 網
IIBITS クレハロンロープ
クレハロン延 繩
クレハロン岩 糸
クレハロン原 糸

社名 大日本紡績株式会社
IBITOR DAI NIPPON SPINNING CO., LTD.
所 大阪市東区安土町2の30
DRESS NO. 30 2CHOME AZUCHI-MACHI HIGASHI-KU OSAKA
話番号
DLE
品物 ミューロン漁 網
IBITS ミューロンロープ
ミュロン作業衣
ミューロン軍 手
ミューロン帆 布
MEWLON FISHING NET
MEWLON ROPE
MEWLON WORKING WEAK
MEWLON WORKING GLOVES
MEWLON DUCK

社名 旭化成工業株式会社サラン部
IBITOR SARAN DEPARTMENT, ASAHI CHEMICAL INDUSTRY CO. LTD.
所 東京都千代田区有楽町1丁目10番地 (三信ビル)
DRESS SANSIN BUILDING, 10, 1-CHOME YURAKUCHO CHIYODA-KU TOKYO
電話番号 (59) 3411 6336
PHONE
出品物 サラン漁網 (無結節) (有結節) サラン延繩 サラン岩糸 サランロープ サラン漁網用糸
EXHIBITS SARAN FISH NET (KNOTLESS) (ENGLISH KNOTTED), SARAN LONG LINE, SARAN FLOAT LINE. SARAN ROPE. SARAN FISH NET YARN.

会社名 日本漁網船具株式会社
EXHIBITOR THE NIPPON GYOMO SENGU KAISHA LTD.
住所 東京都千代田区丸ノ内2丁目2番地
ADDRESS ROOM NO. 652-5 MARUNOUCHI BUILDING TOKYO
電話番号 (20) 1841-9
PHONE
出品物 落網 巾着網 トロール 手繰網 ナイロン刺網 サラン網 クラロン網 合成浮子 鉛沈子 鮪延繩 ナイロンロープ サランロープ マニラロープ ダルマ灯
EXHIBITS TRAPNET. PURSE. SEINE NET. TRAWLNET (ONE BOAT) (TWO BOAT). GILLNET FOR SALMON SARAN NET. KURALON NET. SINTHETIC RUBBER FLOAT. LEAD SINKER. TUNA LONG LINE. NYLON ROPE. KURALON ROPE. SARAN ROPE. MANILA ROPE. FLOAT WITH BATTERY.

会社名 近江絹網合名会社
EXHIBITOR OHHISILK & COTTON NET M. F. G. CO.
住所 滋賀県坂田郡米原町字磯1747番地
ADDRESS MAIBARA-CHO SHIGA-PREF
電話番号 米原 (MAIBARA) 71 30
PHONE
出品物 ナイロン漁網 ナイロン漁業トワイン ナイロン鳥網
EXHIBITS NYLON FISHING NET. NYLON FISHING TWINE. NYLON BIRD NET.

会社名 桃井製網株式会社
EXHIBITOR MOMOI FISHING NET MEG CO. LTD.
住所 兵庫県赤穂市中広1029
ADDRESS NO. 1029 NAKAHIRO AKAHO-CITY HIYOGO-PREF
電話番号 赤穂 (AKAHO) 65
PHONO

出品物 EXHIBITS: 合成繊維漁網 合成繊維撚糸 綿漁網 スポーッ漁業用袋網 三重網 ビニコン浮子

会社名 EXHIBITOR: **函館製網船具株式会社**
HACODATE FISHING NET MFG & CHANDLERY CO., LTD.

住所 ADDRESS: 函館市末広町82
NO. 82 SUEHIROCHO HARODATE-CITY JAPPAN
東京事務所 東京都中央区銀座西8の8
TOKYO OFFICE NO. 8 8-CHOME NISHI-GINZA CHUO-KU TOKYO

電話番号 PHONE: TOKYO OFFICE (59) 3021

出品物 EXHIBITS: アミラン網地見本 染色撚糸見本 漁網模型 野見式揚網機
SANPLES OF NYLON FISHING NET.
SAMPLES OF NYLON NET
SAMPLES OF COLOURED NYLON TWINE
SAMPLES OF NYLON TWINE
MODEL OF NYLON FISHING NET

会社名 EXHIBITOR: **新大阪ゴム株式会社**
NEW OSAKA RUBBER CO. LTD.

住所 ADDRESS: 本社 大阪市西淀川区佃町5丁目50番地
出張所 東京都中央区八丁堀4の3 本間ビル
HEAD OFFICE NO. 50 5-CHOME TSUKUDA-CHO NISIYODOGAWA-KU OSAKA
TOKYO BRANCHI NO3 4-CHOME HACHOBORI CHUO-KU TOKYO

電話番号 PHONE: 本社 大阪淀川 (47) 1758～9
東京出張所 東京築地 (55) 3121～2 4484
HEAD OFFISS OSAKA YODOGAWA (47) 1858～9
TOKYO BRANCHI TOKYO TSUKIJI (55) 3121～2 4484

出品物 EXHIBITS: 合成ゴム製浮子
PAMA FROAT

会社名 EXHIBITOR: **大機ゴム工業株式会社**
DAIKI RUBBER INDUSTRY CO,. LTD.

住所 ADDRESS: 東京都港区芝田村町2丁目2番地
NO. 2, 2-CHOME SHIBA TAMURACHO MINATO-KU TOKYO

電話番号 PHONE: (57) 6111～5

出品物 EXHIBITS: 塩ビ製浮子
POLYVINLIDENE-CHLORIDE FLOATS FOR FISHING NET

会社名 EXHIBITOR: **極東化成工業株式会社**
EASTERN PLASTIC INDUST CO., LTD.

住所 ADDRESS: 東京都墨田区向島3丁目16番地
NO. 16, 3-CHOME MUKOJIMA SUMIDAKU TOKYO

電話番号 PHONE: (63) 3349 6647

出品物 EXHIBITS: ビニール スポンヂ 漁網浮子
VINYL SPONGE FISHING N FLOAT

会社名 EXHIBITOR: **東北ゴム株式会社**
TOHOKU RUBBER CO., LTD.

住所 ADDRESS: 本社 仙台市長町東裏北55
東京営業所 東京都中央区日本橋江橋2丁目4番地
HEAD OFFICE 55 HIGASHI URAKITA-CHO SENDAI MIYA -PREFECTURE
TOKYO BRANCHI NO. 4 2-CI ME NIHONBASHI-EDOBASHI CHUO-KU TOKYO

電話番号 PHONE: 本社 (HEAD OFFICE)
仙台 (SENDAI) (2) 3159 (3) 28
東京営業所 (TOKYO BRANCHI (27) 9028 9078

出品物 EXHIBITS: ビニール スポンヂ 漁網浮子
VINYL SPONGE FISHING N FLOAT

PANELS OF TECHNICAL COMMITTEES

ordance with the procedural practice adopted at the Sixth Session, five panels were appointed to he technical aspects of the fisheries problems both at the Session and during the ensuing period as w. It was decided that a special panel for Miscellaneous Fisheries and General Biology under Committee I could be constituted as necessity arose by requesting suitable specialists to serve on it.

PANELS OF TECHNICAL COMMITTEE I

ountry	*Panel A* (Inland Fisheries)	*Panel B* (Sea Fisheries)
..	.. Dr. A. G. Nicholls	Mr. J. M. Thomson
..	.. U Kyaw Nyi	U Tint Hlaing
..	.. Mons. Dom-Saveun	No nomination
..	.. Mr. A. Indrasena	Mr. S. Sivalingam
..	.. Mons. J. Lemasson	Mons. M. P. Legand
..	.. Mr. K. H. Alikunhi	Dr. S. Jones
..	.. *Mr. H. Saanin	Mr. R. S. Natadisastra
..	.. Dr. K. Kuronuma	Mr. T. Nakai
..	.. Mr. Whang Ho Chung	Mr. Chee Choul Keun
ds ..	.. No nomination	No nomination
..	.. Dr. N. Ahmad	Dr. M. R. Qureshi
..	.. Mr. H. R. Rabanal	Mr. I. A. Ronquillo
..	.. Nai J. Thiemmedh	Nai S. Charernphol
..	.. Mr. J. D. Bromhall	*Dr. F. D. Ommanney
..	.. Dr. L. A. Walford	Dr. A. L. Tester
..	.. Mons. Cao Thien Buu	Mons. Ngo Ba Thanh

PANELS OF TECHNICAL COMMITTEE II

ountry	*Panel A* (Craft & Gear)	*Panel B* (Food Technology)	*Panel C* (Socio-economics & Statistics)
.. ..	Mr. F. F. Anderson	Dr. J. Vickery	Mr. F. J. Kearns
.. ..	U Ba Kyaw	No nomination	U E Than
.. ..	No nomination	Mons. R. Lafont	Mons. Sao Leang
.. ..	Mr. L. F. Tisseverasinghe	Mr. E. St. C. Gunasekera	Mr. Y. Yogasunderam
.. ..	No nomination	No nomination	No nomination
.. ..	Dr. C. V. Kulkarni	Dr. K. C. Saha	Mr. G. N. Mitra
.. ..	Mr. R. A. Kartono	Mr. J. R. Pattinasarany	Mr. Eddiwan
.. ..	*Mr. S. Takayama	*Dr. S. Watari	*Mr. N. Oka
.. ..	Mr. Nam Sang Kyu	Mr. Rhee Bong Nae	Mr. Rhee Bong Nae
s ..	No nomination	No nomination	No nomination
.. ..	Dr. M. R. Qureshi	Dr. M. R. Khan	Mr. S. A. Jaleel
.. ..	Mr. S. B. Rasalan	Mr. J. I. Sulit	Mr. J. R. Montilla
.. ..	Nai S. Ruomruk	Nai K. Suriyong	Nai P. Thavaranusorn
.. ..	Fisheries Officer, Dept of Agri., Fish. and Forestry, Hong Kong	Marketing Officer, Co-operative and Marketing Dept., Hong Kong	Marketing Officer, Co-operative and Marketing Dept., Hong Kong
.. ..	Mr. G.M. Taggart	Dr. M. E. Stansby	Mr. L. S. Christey
.. ..	Mons. Tran Van Tri	Dr. Ngo Ba Thanh	Mons. Nguyen Van Tich

* Chairman

The full PROCEEDINGS of this Session consist of two sections of which the first, Report of Proceedings, is contained in this issue. Section II comprises the Technical Papers presented at the Session by Delegations whilst Papers read at a Symposium on Prawn Fisheries are published as Section III.

Copies of the Proceedings are distributed free to the Council's Member Governments and on an exchange basis to Institutions in Asia and the Far East. A limited number of copies of the Council's PROCEEDINGS will be available for sale on application to the Council's Secretariat in Bangkok or to the Publications Section, FAO, Rome, Italy.